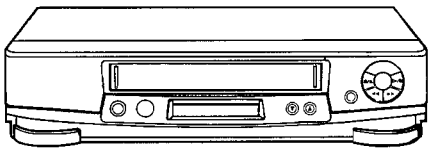
HITACHI

SERVICE MANUAL



V26223

TK | No.5010E

VT-FX950E(NA)
VT-FX950E(UKN)
VT-FX950E(UKN)C
VT-FX950E(VPS)

US MECHANISM

This service manual does not include information on the US Mechanism used in this model. Use this manual together with the following manual.

Manual related to the VT-FX950E

Name of manual	Manual No.	Chapters Included
US Mechanism	4527E	------

VHS

This video deck is a VHS type video recorder. For proper operation, only the VHS type cassette must be used.

VIDEO Plus+

SHOWVIEW

SPECIFICATIONS AND PARTS ARE SUBJECT TO CHANGE FOR IMPROVEMENT

VIDEO CASSETTE RECORDER

April 2000 Digital Media Products Division, Tokai

PRODUCT SAFETY NOTICE

Many electrical and mechanical parts have special safety-related characteristics. These are often not evident from visual inspection nor can the protection afforded by them necessarily be obtained by using replacement components rated for a higher voltage, wattage, etc. Replacement parts which have these special safety characteristics are identified in this Service Manual. Electrical components having such features are identified by marking with a ⚠ on the schematics and the parts list in this Service Manual. The use of a substitute replacement component which does not have the same safety characteristics as the HITACHI recommended replacement one, shown in the parts list in this Service Manual, may create shock, fire, or other hazards. Product safety is continuously under review and new instructions are issued from time to time. For the latest information, always consult the current HITACHI Service Manual. A subscription to, or additional copies for, HITACHI Service Manual may be obtained at a nominal charge from HITACHI SALES CORPORATION.

Notes When Using Service Manual

The following shows the contents to be noted when using service manual:

1. Value units used in parts list

Certain symbols are indicated below for value units of resistors, capacitors and coils in parts list. When you read them note the following regular indications:

Parts	Indication in list	Regular indication
Resistor	KOHM	kΩ
Capacitor	UF	μF
	PF	pF
Coil	UH	μH
	MH	mH

2. Values in schematic diagrams

The values, dielectric strength (power capacitance) and tolerances of the resistors (excluding variable resistors) and capacitors are indicated in the schematic diagrams using abbreviations.

[Resistors]

Item	Indication
Value	No indication ····· Ω K ····· kΩ M ····· MΩ
Tolerance	No indication ····· ±5% (All tolerances other than ±5% are indicated in schematic diagrams)
Power capacitance	No indication ····· 1/8W (1/16W for leadless resistors without indication) All capacitances other than the above are indicated in schematic diagrams.

[Capacitors]

Item	Indication
Value	No indication ····· μF P ····· pF
Dielectric strength	No indication ····· 50V (All dielectric strengths other than 50V are indicated in schematic diagrams)

[Coils]

Item	Indication
Value	μ ····· μH m ····· mH

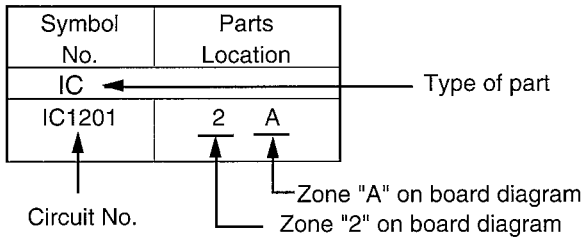
3. Identifications of sides A/B in circuit board diagrams

1) Board having a pattern on one side and parts on both sides.
   Side A: Shows discrete parts, viewed from the pattern side.
   Side B: Shows leadless parts, viewed from the pattern side.
2) Board having patterns on both sides and parts on both sides.
   Side A: Shows parts and patterns which can be seen when the case is opened.
   Side B: Shows parts and the pattern on the back of side A.

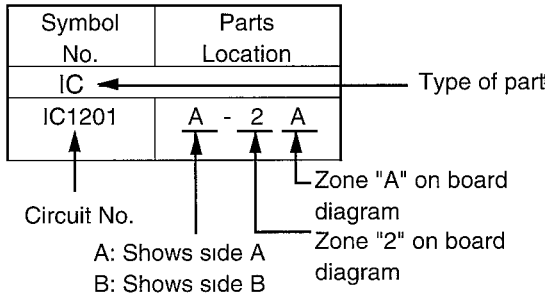
4. Table for indexing locations of parts

This table shows locations of each part on circuit board diagrams. The locations are indicated using the guide scales on the external lines of diagrams.

1) One diagram indicated for each board



2) Two diagrams indicated for each board



CONTENTS

CHAPTER 1 GENERAL INFORMATION

SPECIFICATIONS 1-1
COMPARISON OF FEATURES 1-2
COMPARISON OF MAIN CONTROL ICs 1-3
TIPS FOR SERVICING 1-4
How to Remove the Cassette when a
Malfunction Has Occurred in the Mechanism 1-4
TROUBLE DISPLAY FUNCTION 1-5
Troubleshooting According to malfunction Display 1-6
Instructions on Use 1-12

CHAPTER 2 DISASSEMBLY

1.Before Starting Disassembly 2-1
2.Disassembly Method 2-1
Parts Hierarchy Chart 2-1
Disassembly Procedure Diagrams 2-2
2-1.Top cover, front panel, rear panel, RJK board
and US-FL mechanism 2-2
2-2.Cassette door and buttons 2-2
2-3.Front frame and LCD board 2-3
2-4.US mechanism/MAS board assembly
and N&A or A2 board 2-3
2-5.Separation of MAS board from US mechanism 2-4
2-6.Procedure to remove only the US mechanism 2-4
3.Cautions When Reinstalling the US Mechanism 2-5

CHAPTER 3 ELECTRIC CIRCUIT ADJUSTMENT

Service Position 3-1
1.Servicing position during electrical adjustment 3-1
2.Servicing positions when repairing and
checking circuits 3-1
3.Be careful of electric shocks 3-1
Electrical Circuit Adjustment 3-2
1 Test equipment/jigs necessary for adjustment 3-2
2.Cautions on adjustment 3-2
3.Tips for adjustment 3-2
4.Connections of test equipment 3-3
5.Test Points and Adjustment points 3-3
6.Servo Circuit Adjustments 3-4
6-1.Switching point adjustment 3-4
6-2.X-value adjustment 3-4
6-3.Vertical jitter adjustment 3-5
6-4.Forward slow tracking preset adjustment 3-5
6-5.Reverse slow tracking preset adjustment 3-5
7.Audio Circuit Adjustment 3-6
7-1.Hi-Fi audio playback level check 3-6
7-2.E-E audio level check 3-6
8.Cylinder Rotation Accumulated
Hours of Usage Display 3-6
9.List of Data in EEPROM and Initial Settings 3-6
10.List of Hidden Commands 3-7
10-1.Mode setting commands during adjustment 3-7
10-2.EEPROM initialization commands 3-7
11.Caution When Replacing IC903(EEPROM) 3-7

CHAPTER 4 EXPLODED VIEWS

1.CABINET SECTION 4-1
2.US-MECHANISM (TOP VIEW) SECTION 4-2
3.US-MECHANISM (BOTTOM VIEW) SECTION 4-3
4.US-FL MECHANISM SECTION 4-4

CHAPTER 5 REPLACEMENT PARTS LIST

1.MECHANISM PARTS LIST 5-1
2.ELECTRICAL PARTS LIST 5-2

CHAPTER 6 SCHEMATIC, CIRCUIT BOARD AND BLOCK DIAGRAMS AND MICROPROCESSOR PIN FUNCTION TABLES

CONNECTION DIAGRAM 6-1

	SCHEMATIC DIAGRAM	CIRCUIT BOARD DIAGRAM
LCD DISPLAY (LCD)	6-3	6-27
MAIN-1 (MAS)	6-5	6-17
MAIN-2 (MAS)	6-8	6-17
CYLINDER MOTOR	6-11	-
CAPSTAN MOTOR	6-11	-
NICAM (N&A) [FOR (UKN), (UKN)C, (NA)]	6-13	6-25
A2 (A2) [FOR (VPS)]	6-14	6-27
REAR JACK (RJK)	6-15	6-25

BLOCK DIAGRAMS
MAIN CONTROL 6-29
SERVO 6-31
VIDEO 6-33
AUDIO 6-35
POWER SUPPLY 6-37
MICROPROCESSOR PIN FUNCTION TABLES 6-39

CHAPTER 1 GENERAL INFORMATION

1. SPECIFICATIONS

Format:	VHS PAL Standard
Recording:	Rotary Two-Head Helical Scan Azimuth Recording
Tape Speed:	23.39 mm/sec.--SP, 11.7 mm/sec.--LP
Tape Width:	12.7 mm
Operation Temperature:	5 °C TO 40 °C
Video:	PAL colour (system I) & CCIR monochrome signals 625 lines [For (UKN), (UKN)C]
	PAL colour (system B & G) & CCIR monochrome signals 625 lines [For (NA), (VPS)]
Recording Time:	240 min. with E-240 cassette--SP
	480 min. with E-240 cassette--LP
Aerial input:	VHF channels 2--12
	CATV channels S1--S41 [For (NA), (VPS)]
	CATV channels X--Z+2 [For (NA), (VPS)]
	UHF channels 21--69
RF Output:	UHF channels 35 (22--69 adjustable) (System I) [For (UKN), (UKN)C]
	UHF channels 37 (22--69 adjustable) (System G) [For (NA), (VPS)]
Video Input:	0.5 to 1.5 Vp-p 75 ohm Unbalanced
Video Output:	1 Vp-p 75 ohm Unbalanced
S/N Ratio (Video):	More than 43 dB
Horizontal Resolution:	Colour 260 lines

Audio (Linear)

Input:	PERI: -3.8 dBm 10 Kohm, LINE: -7.8 dBm 50 Kohm
Output:	PERI: -3.8 dBm 1 Kohm, LINE: -7.8 dBm 1 Kohm
S/N Ratio:	43 dB
Frequency Range:	70 Hz to 12 kHz

Hi-Fi Audio

Frequency Range:	20 Hz to 20 kHz
Dynamic Range:	More than 90 dB
Wow and Flutter:	Less than 0.005% WRMS
RF Audio Reception:	NICAM Digital stereo (I-PAL) [For (UKN), (UKN)C]
	NICAM Digital stereo (B/G),
	IGR (A2) Stereo (B/G) [For (NA), (VPS)]

Fast Forward/Rewind Time: 90secs. on S.FF or S.REW.

Power:	AC230V, 50 Hz
Power Consumption:	18 W (including timer) [For (VPS)]
	3.0 W (standby mode) [For (VPS)]
	19 W (including timer) [For (NA), (UKN), (UKN)C]
	3.0 W (standby mode) [For (NA), (UKN), (UKN)C]
Timer:	24-hour digital indication
Cabinet Size:	380 mm (W) x 93 mm (H) x 275 mm (D)
Weight:	Approx.. 3.5 kg
Accessories Included:	1--Aerial cable
	1--Infrared remote control handset
	2--Batteries

* Design and specifications are subject to change without notice.

2. COMPARISON OF FEATURES

	ITEM	VT-FX950E	VT-FX880E/FX860E/FX850E/FX840E/MX835E
GENERAL	VIDEO HEADS	DA4 Heads + Hi-Fi SP : 48 µm LP : 24 µm Hi-Fi : 28 µm	DA4 Heads + Hi-Fi (Except for MX835E) DA4 Heads (For MX835E) SP : 48 µm LP : 24 µm Hi-Fi : 28 µm
	BASIC CHASSIS TYPE	US	US
	CAPSTAN DRIVE	DIRECT DRIVE	DIRECT DRIVE
	CYLINDER MOTOR	THREE-PHASE OUTER ROTOR : 360Hz	THREE-PHASE OUTER ROTOR : 360Hz
VIDEO	PAL COLOUR	B/G (For NA, VPS) I (For UKN)	B/G (Except for UKN, UK) I (For UKN, UK)
	MESECAM COLOUR	NO	YES (For FX880E)
TUNER	TUNING SYSTEM	F.S TUNING	F.S TUNING
	CATV	YES (For NA, VPS)	YES (Except for UKN,UK)
	CHANNEL PRESET No.	49CH	49CH
	RF CONVERTER	B/G (For NA, VPS) I (For UKN)	B/G (Except for UKN,UK) I (For UKN,UK)
	RF CONV. CHANNEL (32-42)	37 (For NA, VPS) 35 (For UKN)	37 (Except for UKN,UK) 35 (For UKN,UK)
	A2	YES (For NA, VPS)	YES (Except for UKN,UK)
	UK NICAM	YES (For UKN)	YES (For UKN)
	CT NICAM	YES (For NA)	YES (For NA,NAV)
TIMER	REC. PROGRAMME	8 PROG./1 YEAR	8 PROG./1 YEAR
	DIMMER	YES (AUTO)	YES (AUTO)
	IRT	NO	LENGTH ONLY (For FX880E)
	BACK-UP TIME	ABOUT 30 MIN.	ABOUT 30 MIN.
	PDC	YES (For NA, UKN)	YES (Except for VPS)
	VPS	YES (For VPS)	YES (For VPS,NAV)
OTHER FEATURES	AUTO HEAD CLEANING	YES	YES
	POWER SAVE	YES	YES
	EDIT IN/OUT JACK	NO	NO
	TAPE SPEED	SP/LP	SP/LP
	VIDEO DUB	NO	NO
	AUDIO DUB	NO	NO
	X2 PLAY	NO	NO
	SLOW/REV.SLOW PLAY	YES	YES
	F.ADV PLAY	YES	YES
	SATELLITE CONTROL	NO	YES (For FX880E)
	SHUTTLE RING	NO	YES (For FX880E/FX860E/MX835E)
	JOG DIAL	NO	YES (For FX880E)
	NTSC PLAYBACK	YES	YES
	FRONT A/V INPUT JACK	NO	YES (ForFX880E/FX860E/MX835E)
	COUNTER GO-TO	NO	NO
	TITLE INDEX	NO	NO
	TROUBLE MODE	YES	YES
	TAPE NAVIGATION	NO	YES (For FX880E/FX860E/MX835E)
	CLOSED CAPTION	NO	YES (For FX880E/FX860E/MX835E)
	CM ADVANCE	NO	YES (For FX880E(UKN))
AUTO FEATURES	AUTO TRACKING	YES	YES
	AUTO OPERATE ON	YES	YES
	AUTO PLAY	YES	YES
	AUTO REWIND	YES	YES
	AUTO REW.SHUT OFF	YES	YES
	AUTO INSTALL	YES (For UKN)	YES (For UKN,UK)
	AUTO SEEK	YES (For UKN)	YES (For UKN,UK)
	AUTO TAPE CANCELLER	YES	YES
REMOTE CONTROL	PROGRAMME SETTING	NO	LCD (For FX880E)
	CLOCK SETTING	NO	LCD (For FX880E)
	VCR1/VCR2/TV	NO	YES (For FX880E)
	SHOW VIEW	YES (For NA, VPS)	YES (Except for UKN,UK)
	VIDEO PLUS+	YES (For UKN)	YES (For UKN,UK)

3. COMPARISON OF MAIN CONTROL ICs

ITEM	VT-FX950E	VT-FX880E/FX860E/FX850E/FX840E/MX835E
VIDEO SYSTEM		
Y/CHROMA PROCESS	JCP8016MSB (IC0201)	JCP8016MSB (IC0201)
CCD DELAY	Included in IC201	Included in IC201
PRE/REC AMP		
AUDIO HEAD AMP	AN3329S (IC1102)	AN3329S[Except for MX835E] (IC1102)
VIDEO HEAD AMP	Included in IC201	Included in IC201 (IC1101)
AUDIO		
FM AUDIO PROCESS	AN3964FB (IC0501)	AN3964FB (IC0501)
MAIN CONTROL		
MAIN µP (system control µP)	HD6433977SC65F (IC0901)	HD6433977SC52F[FX880E] HD6433977SC46F[FX860E] HD6433977SC39F [FX850E/FX840E/MX835E(VPS)] HD6433977SC50F[MX835E(UK)] (IC0901)
EEPROM	ST24C04 (IC0903)	ST24C02 6[FX880E] ST24C04[Except for FX880E] (IC0903)
TAPE LOADING DRIVE	BA6209 (IC0904)	BA6209 (IC0904)
SERVO CONTROL	Included in Main µp	Included in Main µp
NICAM (Except for VPS)		
NICAM DECORDER	TDA9874H (IC1801)	TDA9874H (IC1801)
DUAL OPE. AMP	NJM4558M (IC1802)	NJM4558M (IC1802)
A2 (For VPS)		
ST/DUAL SOUND PROCESSOR	TDA9840T (IC1871)	TDA9840T (IC1851)
FM DEMODULATOR	TDA9821 (IC1872)	TDA9821 (IC1852)
PDC/VPS		
PDC/VPS DECODER	SDA5650 or SDA5649 (IC4581)	SDA5649 or SDA5649 (IC4581)
POWER SUPPLY		
SWITCHING DRIVER	STR-F6653 (IC0851)	STR-F6653 (Q0851)
REAR JACK		
AUDIO SW	----------	LA7151 (IC4551)
VIDEO SW	----------	BH7633AS (IC4501)
AUDIO/VIDEO SELECT SW	LA7147M (IC4501)	LA7147M[Except for MX835E] LA7148M[MX835E] (IC4501)
TAPE NAVIGATION (For FX880E/FX860E/MX835E)		
CCD µP (NAVI control)	----------	M37272M8-143SP [FX880E] M37272M8-140SP [FX860E] M37272M8-117SP [MX835E] (IC4301)
OSD		MB90089-214FP (IC4101)
E^2P ROM		AT24C16N-10SC [Except for FX880E(UKN)] AT24C64N-10SC [FX880E(UKN)] (IC4302)
RESET	----------	RN5V545AA (IC4303)
SYNC SEPARATER	----------	MM1108XFFE (IC4304)
VIDEO SW	----------	NJM2249M (IC4103)
VIDEO SW	----------	NJM2535M (IC4102)
CM ADVANCE (For FX880E)		
CM ADVANCE	----------	M34510M2-305SP (IC4401)
RESET	----------	RN5VS45AA (IC4402)
AUDIO AMP	----------	NJM2082M (IC4404)
VIDEO GATE &RESET	----------	TC4066BF (IC4405)

4. TIPS FOR SERVICING

How to Remove the Cassette when a Malfunction Has Occurred in the Mechanism

If a cassette is caught in the mechanism because of a malfunction in the mechanism, remove it by the following procedure.

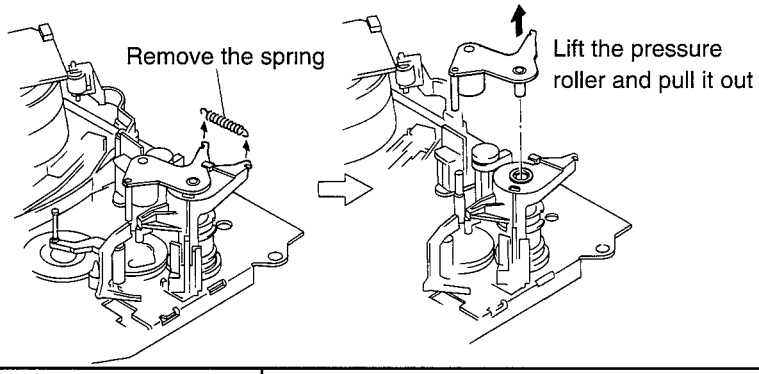
〔Work Procedure〕

1. Remove the top cover.
2. Remove the front panel.

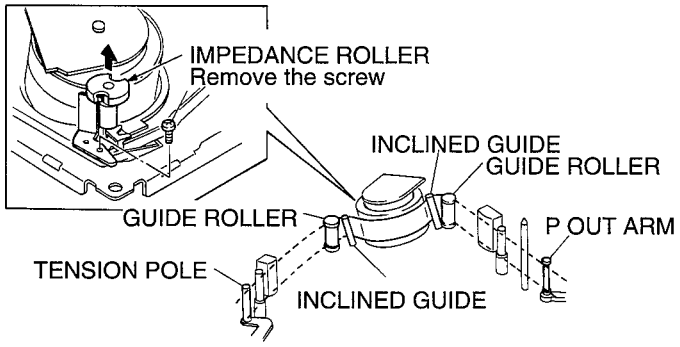
If the tape is wound round the cylinder in the loading state

If the cassette does not come out from the FL mechanism in the unloading state.

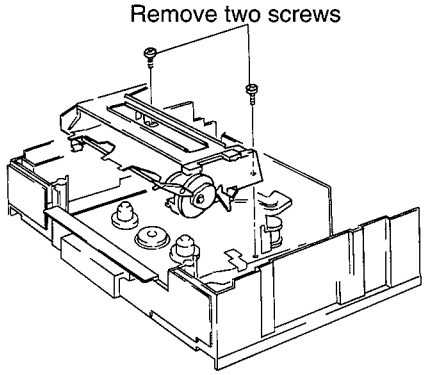
Remove the spring and lift the pressure roller to pull it out.



Slacken the tape and release it from the tension pole, guide rollers, inclined guides and P out arm.



1) Remove two screws holding the FL mechanism.
2) Hold the cassette lid with your fingers so the tape is not damaged and remove the FL mechanism.
3) Remove the slack tape and eject the cassette.



TROUBLE DISPLAY FUNCTION

This VCR has a function which displays mechanism malfunctions, etc. in the LCD display. Use this function to analyze the cause when the power is shut off due to a malfunction, etc. in the mechanism.
Two types of information are displayed, 1) The operation mode when the malfunction occurred, 2)Malfunction Codes.

The details of the malfunction are displayed as follows.

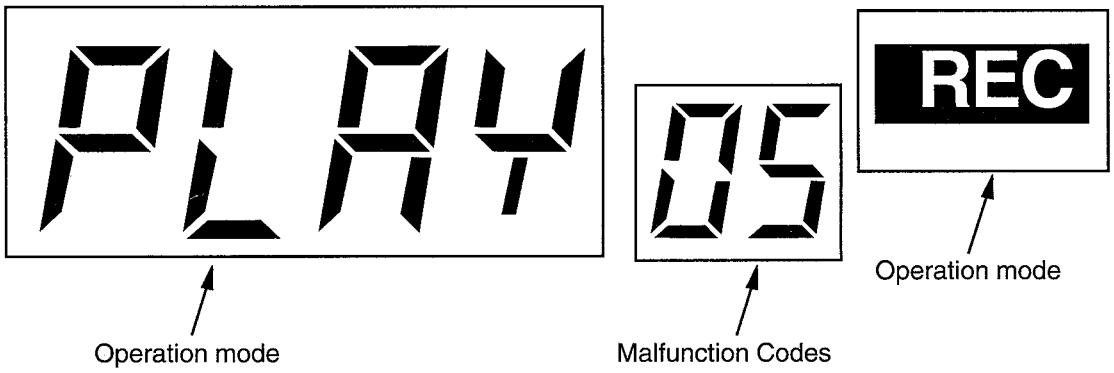
PROCEDURE TO DISPLAY A MALFUNCTION

Press the (CH ▼) button on the VCR when the power is turned off and hold it; the malfunction code is displayed while the button is held depressed.

PROCEDURE TO CLEAR THE MALFUNCTION DISPLAY

Press the "PLAY" button on the VCR and hold it, then press the microprocessor "RESET" button to initialize the trouble display.

LCD DISPLAY



【Display of details of malfunction】

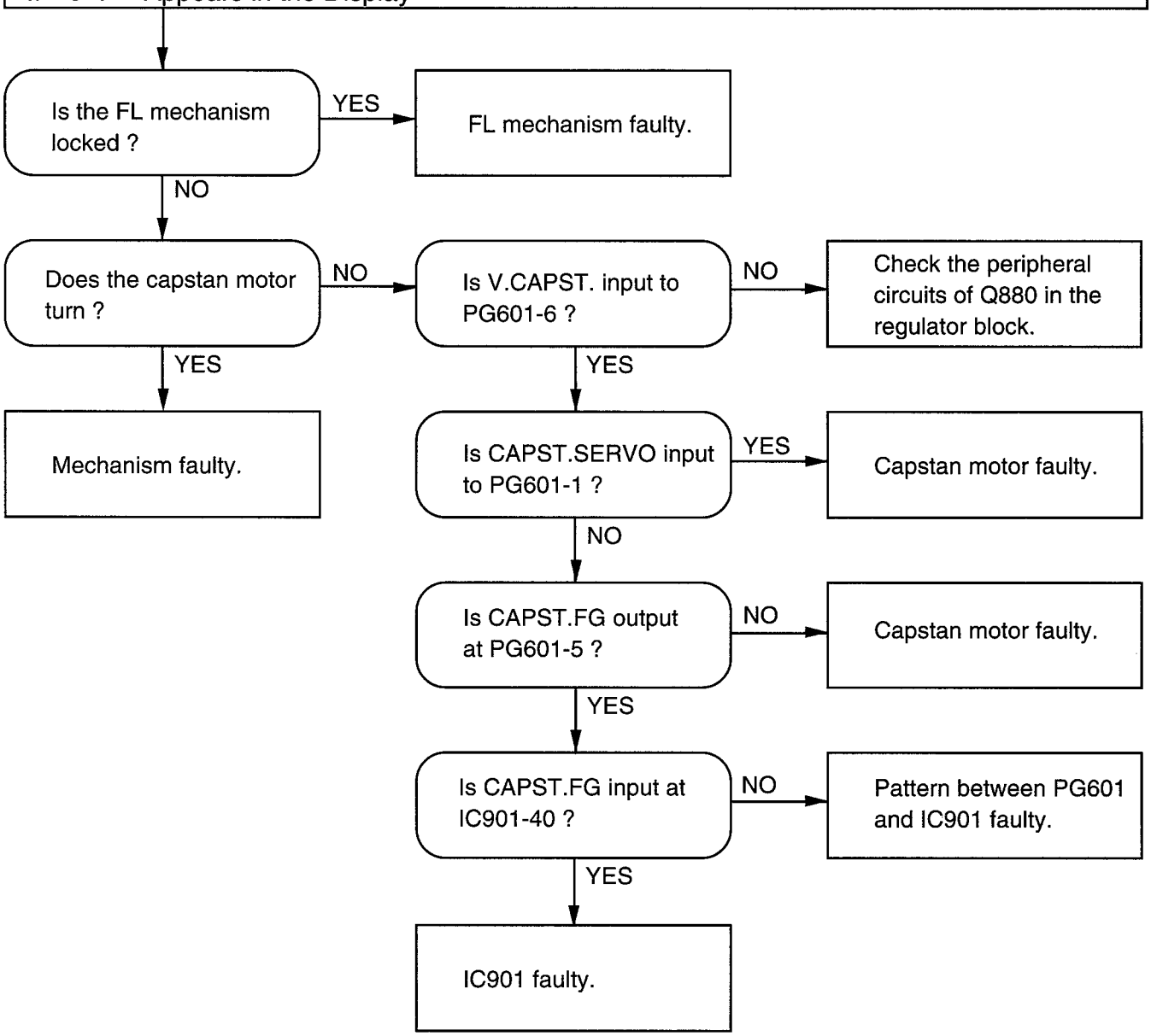
Displayed No.	Item	Details
" 0 0 "	No malfunction	
" 0 1 "	FL mechanism lock	Malfunction in insertion/ejection of cassette
" 0 2 "	Capstan lock unloading	Malfunction of capstan motor drive during tape
" 0 4 "	Reel lock	Reel rotation trouble when tape is running
" 0 6 "	Cylinder lock	Cylinder rotation malfanction
" 0 7 "	Loading mechanism lock	Malfunction in shifting mechanism mode
" 1 6 "	Servo lock	Shorting of 5V detected

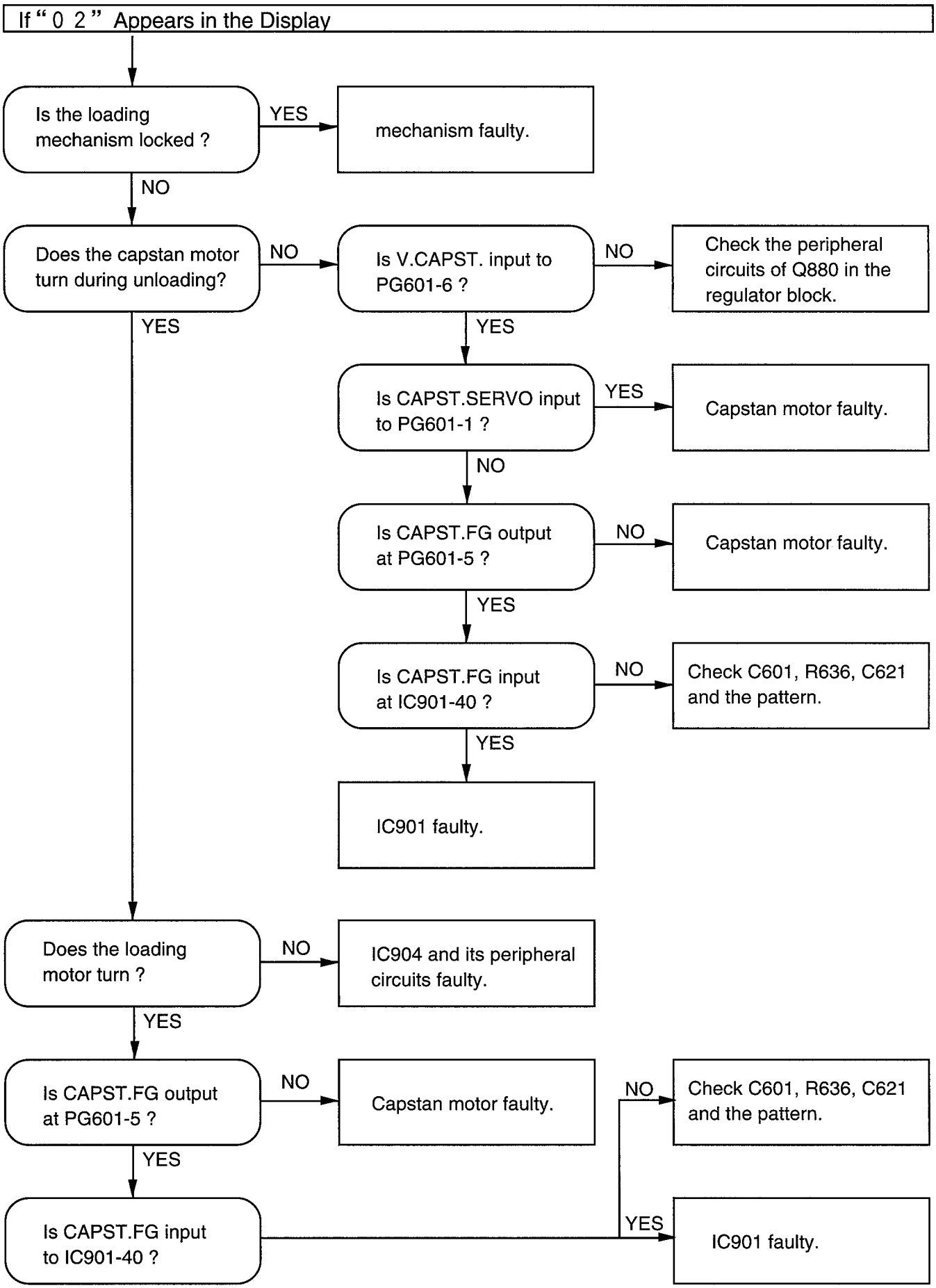
【Mode Display when Malfunction Has Occurred】

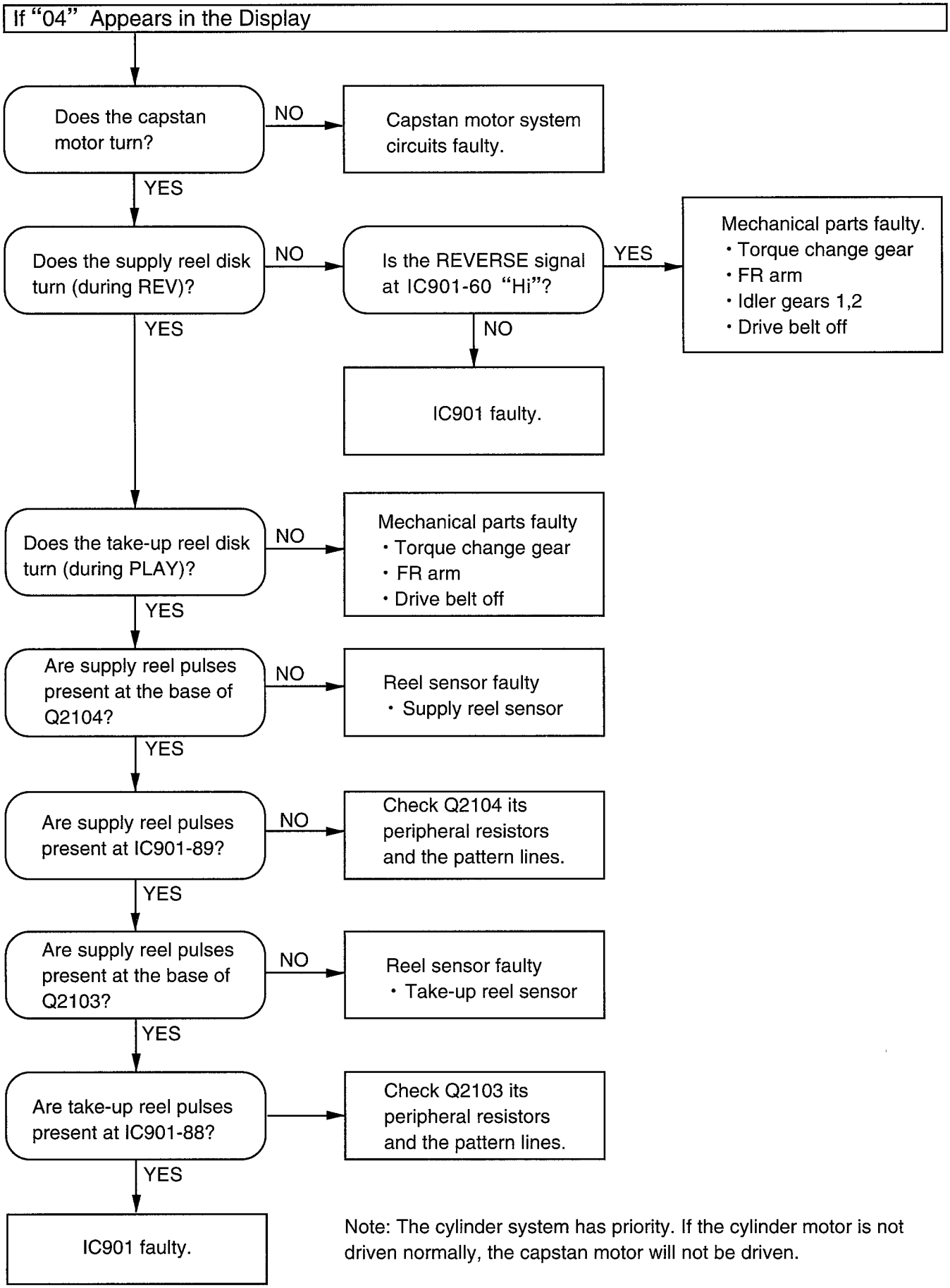
Mode	Display	Mode	Display
Stop	No Display	Playback	P L A Y
Fast forward	F F	Reverse playback	- P L A Y
Rewind	R E W	Forward search	S R C H
Hight speed fast forward	F F	Reverse search	- S R C H
Hight speed rewind	R E W	Slow motion play	S L O W
Recording	REC	Reverse motion slow play	- S L O W
Recording pause	REC (flashes)	Still motion play	S T I L L

No symbols are displayed if the malfunction occurred when a cassette was inserted or ejected, or the power was switched on from off, and off from on.

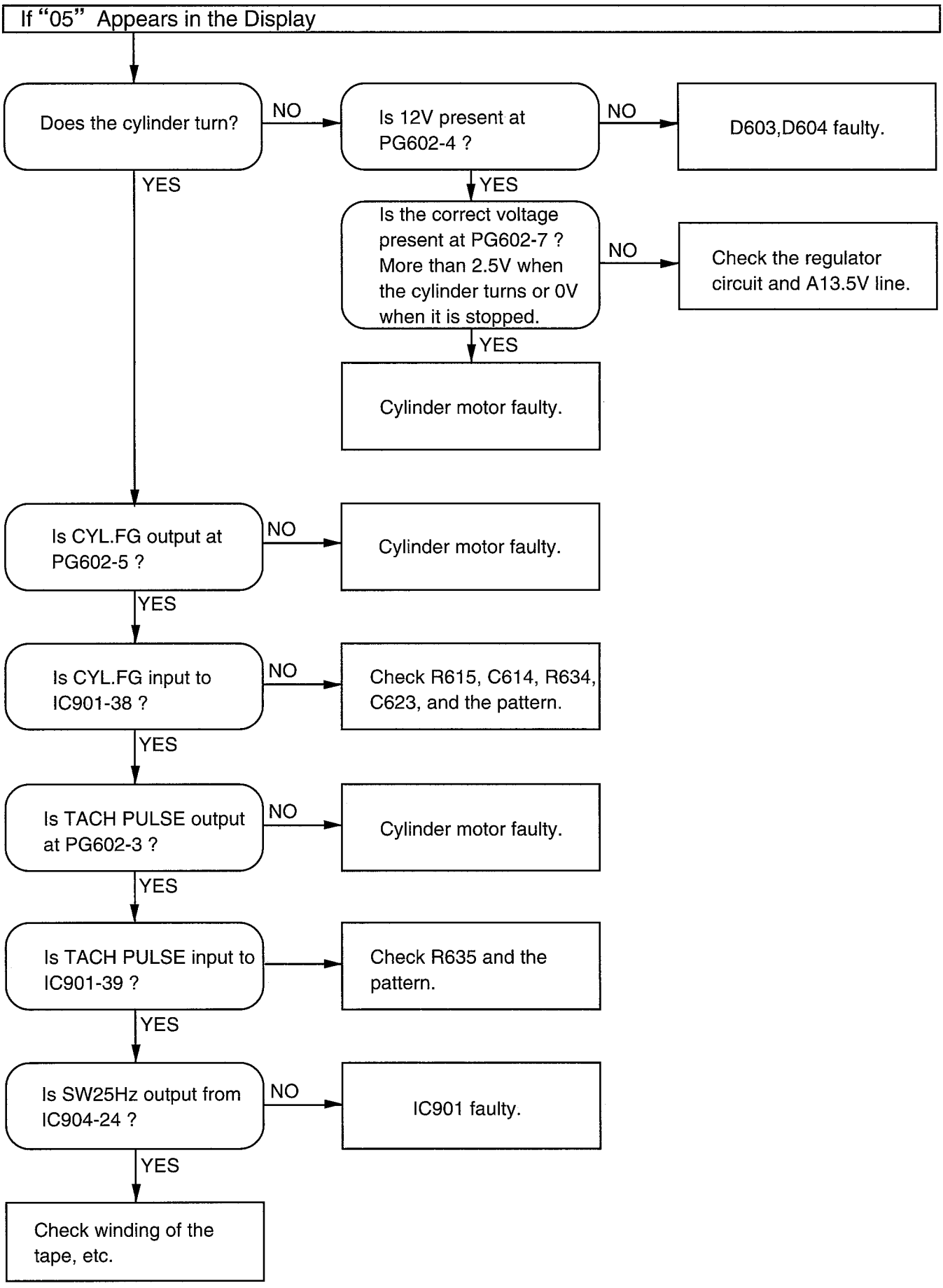
If " 0 1 " Appears in the Display

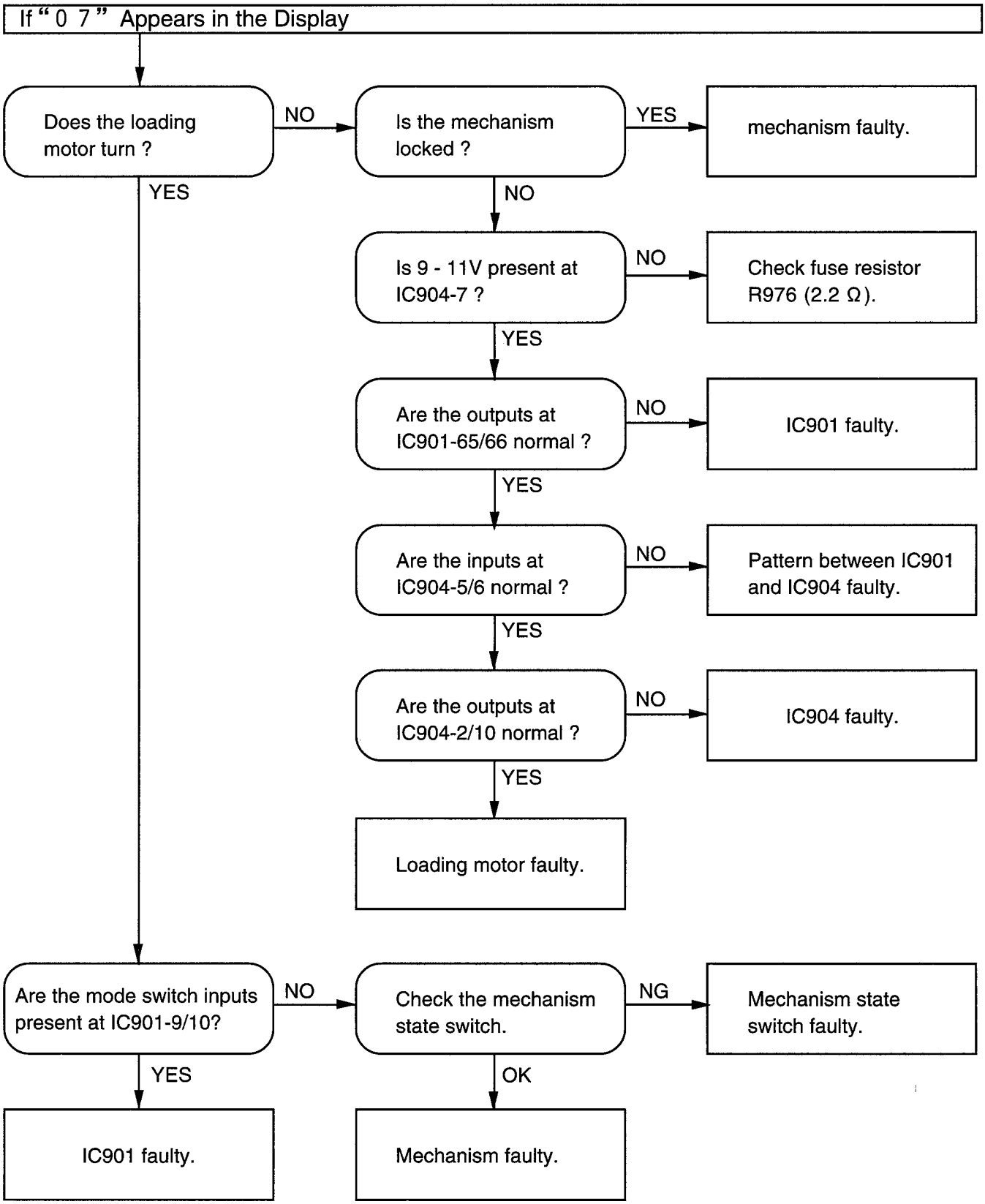


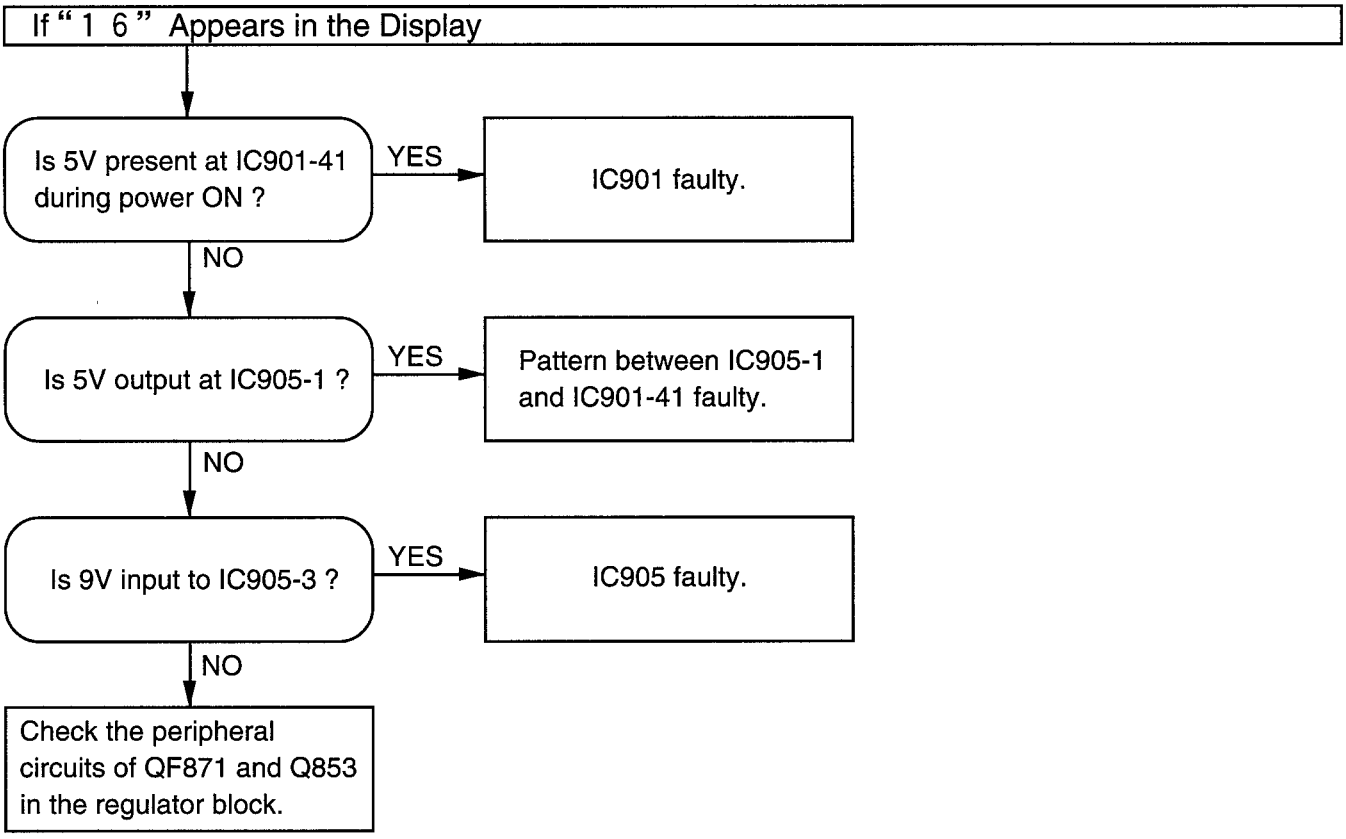

If " 0 2 " Appears in the Display
Is the loading mechanism locked ?
YES
mechanism faulty.
NO
Does the capstan motor turn during unloading?
NO
Is V.CAPST. input to PG601-6 ?
NO
Check the peripheral circuits of Q880 in the regulator block.
YES
YES
Is CAPST.SERVO input to PG601-1 ?
YES
Capstan motor faulty.
NO
Is CAPST.FG output at PG601-5 ?
NO
Capstan motor faulty.
YES
Is CAPST.FG input at IC901-40 ?
NO
Check C601, R636, C621 and the pattern.
YES
IC901 faulty.
Does the loading motor turn ?
NO
IC904 and its peripheral circuits faulty.
YES
Is CAPST.FG output at PG601-5 ?
NO
Capstan motor faulty.
NO
Check C601, R636, C621 and the pattern.
YES
Is CAPST.FG input to IC901-40 ?
YES
IC901 faulty.



Note: The cylinder system has priority. If the cylinder motor is not driven normally, the capstan motor will not be driven.

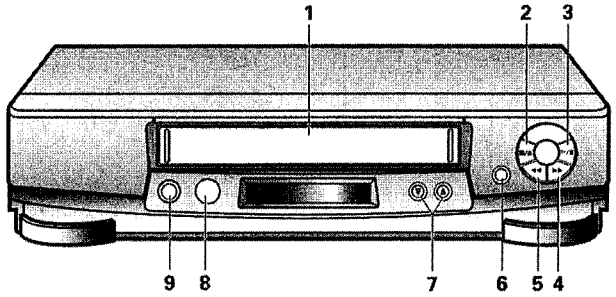

If "05" Appears in the Display
Does the cylinder turn?
NO
Is 12V present at PG602-4 ?
NO
D603,D604 faulty.
YES
YES
Is the correct voltage present at PG602-7 ? More than 2.5V when the cylinder turns or 0V when it is stopped.
NO
Check the regulator circuit and A13.5V line.
YES
Cylinder motor faulty.
Is CYL.FG output at PG602-5 ?
NO
Cylinder motor faulty.
YES
Is CYL.FG input to IC901-38 ?
NO
Check R615, C614, R634, C623, and the pattern.
YES
Is TACH PULSE output at PG602-3 ?
NO
Cylinder motor faulty.
YES
Is TACH PULSE input to IC901-39 ?
Check R635 and the pattern.
YES
Is SW25Hz output from IC904-24 ?
NO
IC901 faulty.
YES
Check winding of the tape, etc.

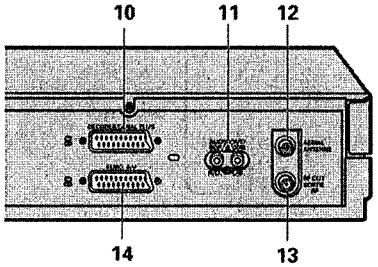

If " 0 7 " Appears in the Display
Does the loading motor turn ?
NO
Is the mechanism locked ?
YES
mechanism faulty.
YES
NO
Is 9 - 11V present at IC904-7 ?
NO
Check fuse resistor R976 (2.2 Ω).
YES
Are the outputs at IC901-65/66 normal ?
NO
IC901 faulty.
YES
Are the inputs at IC904-5/6 normal ?
NO
Pattern between IC901 and IC904 faulty.
YES
Are the outputs at IC904-2/10 normal ?
NO
IC904 faulty.
YES
Loading motor faulty.
Are the mode switch inputs present at IC901-9/10?
NO
Check the mechanism state switch.
NG
Mechanism state switch faulty.
YES
OK
IC901 faulty.
Mechanism faulty.

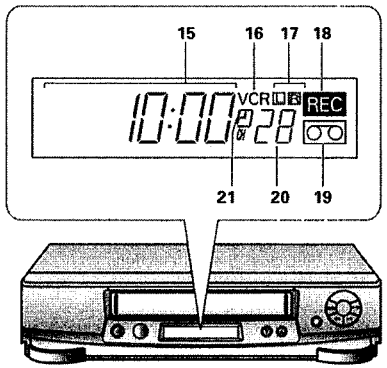

If " 1 6 " Appears in the Display
Is 5V present at IC901-41 during power ON ?
YES
IC901 faulty.
NO
Is 5V output at IC905-1 ?
YES
Pattern between IC905-1 and IC901-41 faulty.
NO
Is 9V input to IC905-3 ?
YES
IC905 faulty.
NO
Check the peripheral circuits of QF871 and Q853 in the regulator block.

CUSTOMER CONTROLS

VCR Customer Controls

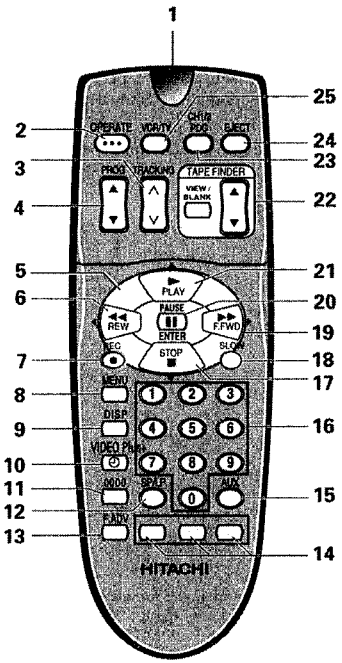






Item No.	Function	Page
1	Cassette compartment	20
2	STOP/EJECT button	24
3	PLAY/STILL button	22
4	FAST FORWARD button	23
5	REWIND button	23
6	REC button	26
7	PROG (programme up/down) buttons	11
8	Remote control receiving window	9
9	OPERATE (Operate/Standby) button	2
10	Decoder socket	47
11	AUDIO OUT (L), (R) sockets for stereo system connection	—
12	AERIAL — signal input	6
13	RF OUT — signal out to TV	6
14	Scart socket	7
	VCR Display	
15	Time,	19
	Time counter or	39
	VCR mode indicator	22
	PLAY— playback ["-" appears during reverse direction viewing]	22
	SRCH— visual search	23
	SLOW— slow play	22
	REW — rewind	23
	S:REW—high speed rewind	23
	FF — fast forward	23
	S:FF — high speed fast forward	23
	STILL— play pause and frame advance	22
16	VCR, operate mode	22
17	Audio indicators	25
18	REC — record (flashes during record pause)	26
19	Tape-in indicator	20
20	TV programme number or	26
	Auxiliary (L1/L2)	45
21	Timer indicator	29

Remote Control Handset Customer Controls



Item No.	Function	Page
1	Transmission window	9
2	OPERATE—switch between operate and standby mode	29
3	TRACKING button	25
4	PROG (programme up ▲/down ▼) button	12
5	These cursor buttons not used	—
6	REW — rewind or search	23
7	REC — record button	26
8	MENU — to recall OSD menu	42
9	DISP — to recall on-screen display, change VCR's display	43
10	VIDEO Plus+ — VIDEO Plus+ programming	30
11	0000 — to correct an incorrect digit, reset the time counter when it appears in the VCR's display	19 39
12	SP/LP — changes tape speed during record	20
13	F. ADV button — advance the picture by one frame during still playback	22
14	These buttons not used	—
15	AUX button — select L1 or L2 input	45
16	Number buttons	19
17	STOP — stops play/record function	24
18	SLOW button— press during playback	22
19	F.FWD — fast forward or search	23
20	PAUSE — pause or still	22
21	PLAY — playback	22
22	TAPE FINDER button used for Index Search, Easy View and Blank search function	40
23	CH1/2 button — for audio channel selection in playback	25
	PDC button — for PDC setting during recording	55
24	EJECT button — press to eject a cassette	20
25	VCR/TV select button	22

CHAPTER 2 DISASSEMBLY

1. Before Starting Disassembly

1) Unplug the power cord from the AC outlet.
2) [Removal procedure]
   If a special procedure is required when dismantling any component, it is indicated using numbers. Follow the numbers ((1),(2),(3) ...) shown in the illustrations.
   [Reinstallation procedure]
   Reinstall each component in the reverse order to removal when otherwise not specified.
3) Insert card connectors securely all the way as they are of the direct insertion type.

Identifications of Circuit Boards

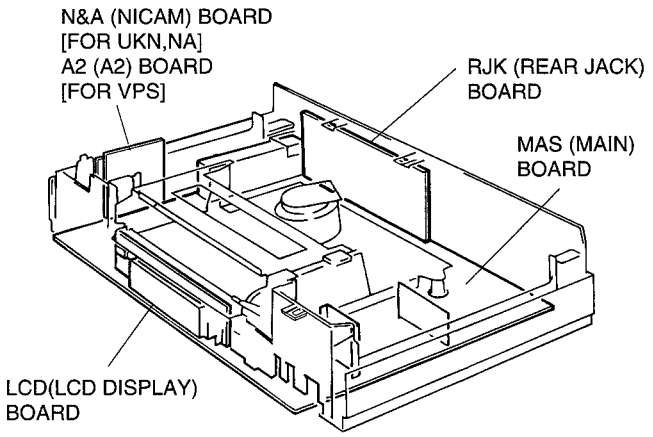


Fig. 1-1

2. Disassembly Method

When replacing defective parts, first refer to the "Parts hierarchy chart" shown below. This chart shows the procedure for parts removal when replacing defective parts.

[How to use the parts hierarchy chart]
(1) Locate the part to be replaced.
(2) Check the parts in the ranks above the part to be replaced and start dismantling.
(3) Replace the defective part and reinstall the parts in the reverse order to that shown in the parts hierarchy chart.

Parts Hierarchy Chart

Note: Dismantle parts in the eject state.

Parts to remove	Item
Top cover	2-1
Front panel	2-1
Rear panel	2-1
US-FL mechanism	2-1
US mechanism/ MAS board assembly	2-5
N&A or A2 board	2-5

Parts to remove	Item
Cassette door	2-2
Buttons	2-2
Front frame	2-3
LCD board	2-4
RJK board	2-1
US mechanism	2-6

Item	Parts to remove
2-1	Top cover, front panel, rear panel,RJK board and US-FL mechanism

◆ Caution when reinstalling the US-FL mechanism

Reinstall the US-FL mechanism in the state that the cassette holder is pulled forward.
(Otherwise, the switch arm could damage the FL switch on the MAS board.)

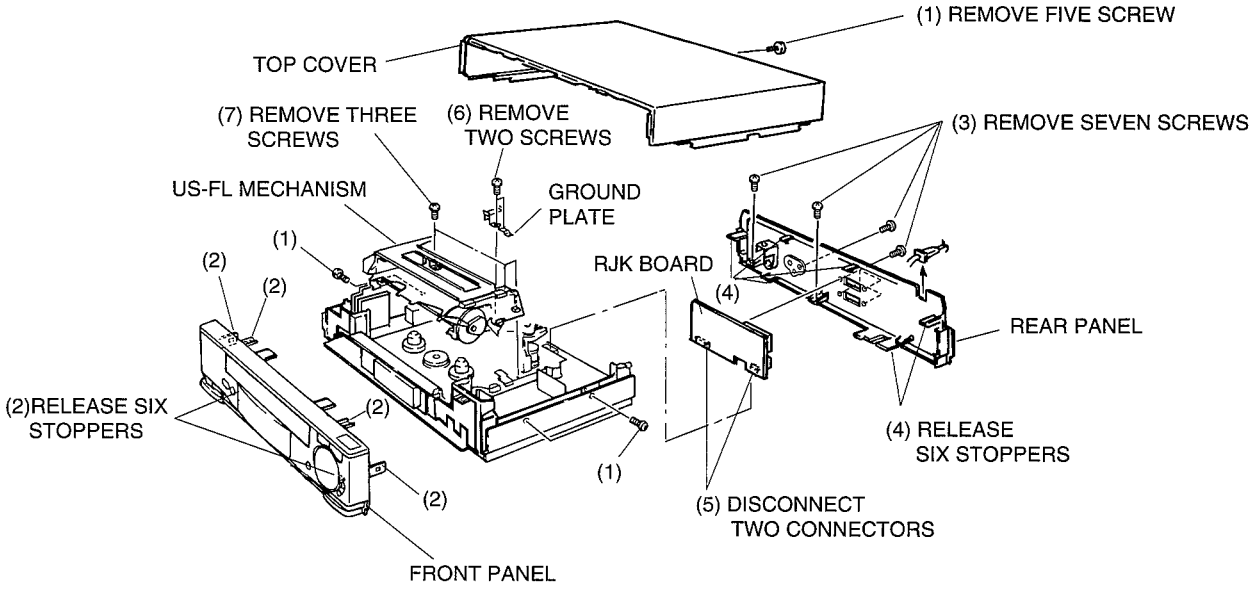
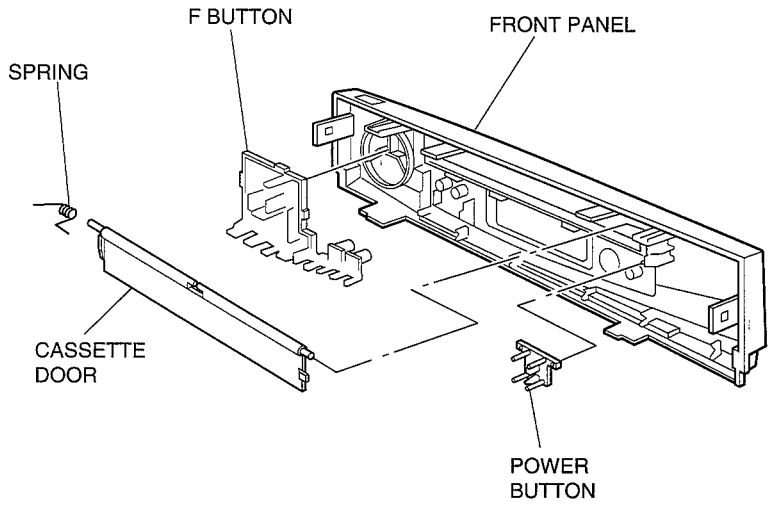


Fig. 2-1

2-2	Cassette door and buttons

◆ Caution when reinstalling the front panel

Reinstall the front panel in the state the cassette door is pushed so the boss of the door arm comes to the front of the boss support of the cassette door.



[CAUTION WHEN REINSTALLING THE FRONT PANE]

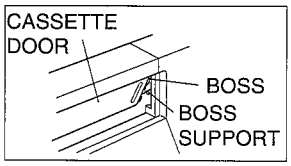


Fig. 2-2

Item	Parts to remove
2-4	Front frame and LCD board

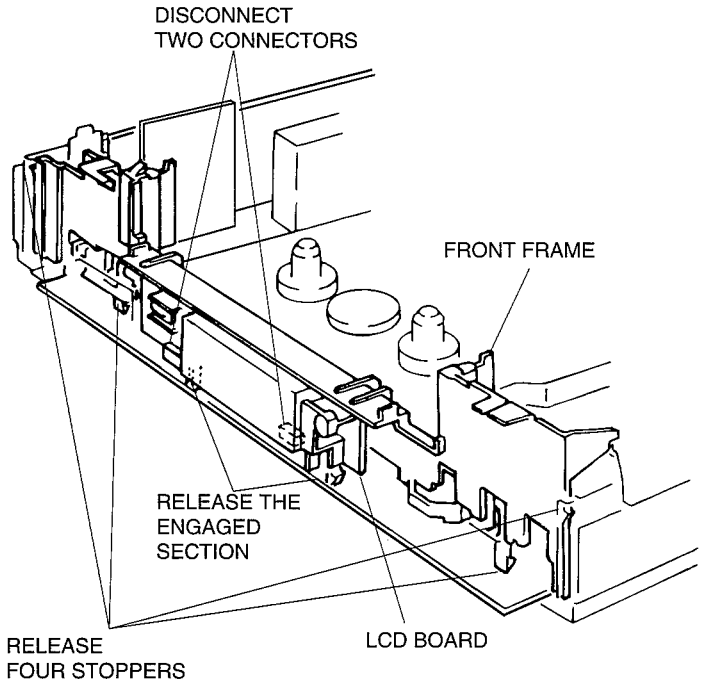


Fig. 2-3

2-4	US mechanism/MAS board assembly and N&A or A2 board

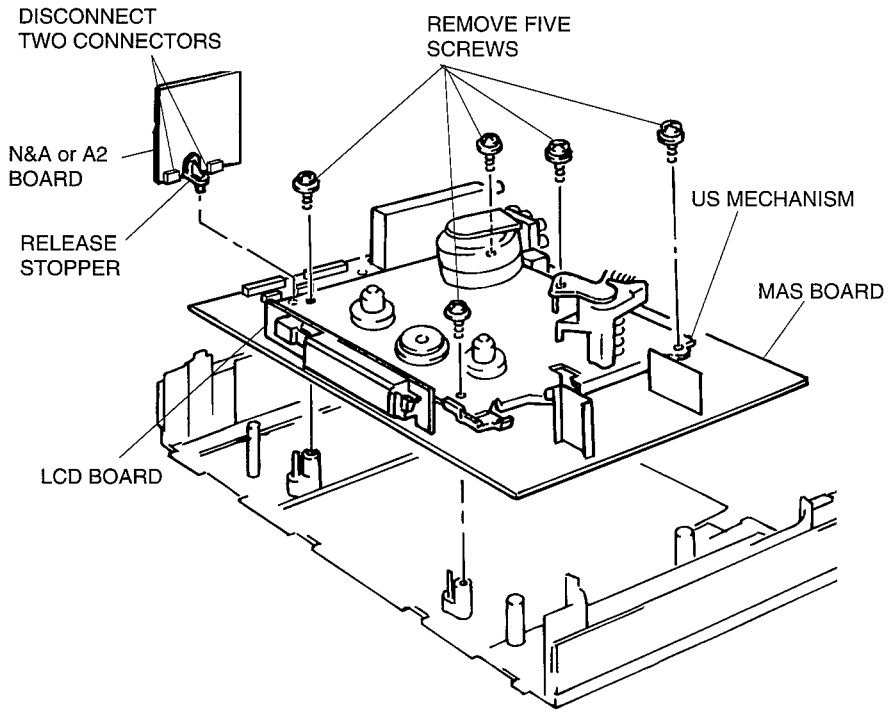


Fig. 2-4

Item	Parts to remove
2-5	Separation of MAS board from US mechanism

[Rear of the mechanism]

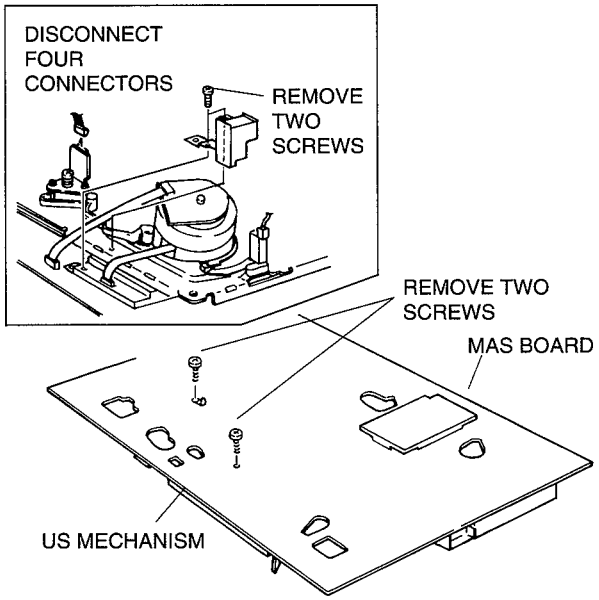


Fig. 2-5

Procedure to remove only the US mechanism

With this VCR the US mechanism can be removed without removing the MAS board. This is done by a different method from the normal disassembly method.

Parts to remove	Item
Top cover	2-1
⇩	
Front Panel	2-1
⇩	
US-FL mechanism	2-1
⇩	
Remove two screws on the bottom of the VCR.	2-6
⇩	
Remove five screws holding the US mechanism.	2-6

2-6	Procedure to remove only the US mechanism

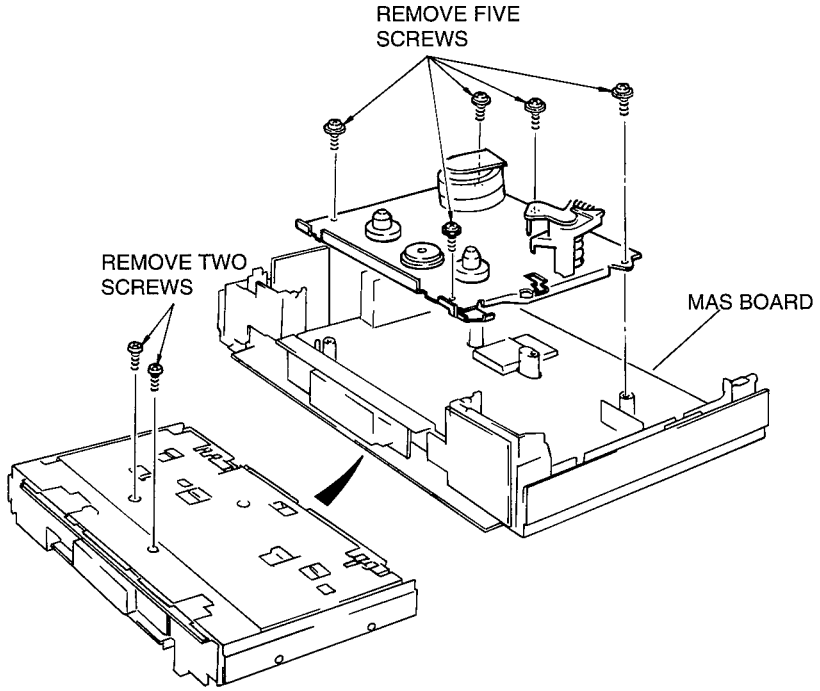


Fig. 2-6

3. Cautions When Reinstalling the US Mechanism

This VCR has mechanism sensors on the MAS board and the capstan and loading motors are connected via direct connectors. Therefore, when reinstalling the US mechanism, observe the following cautions.

1) Align the ▽ mark and mode no. 1 of the mechanism state switch on the MAS board. (Mode no. 1 of the mechanism state switch has a click position.)

2) Check that mode no. 1 on the P drive gear in the mechanism and the ▽ mark of the spring hook are aligned. If they are not aligned, turn the loading motor pulley to align them.

3) Pass the end LED through the hole in the mechanism and install the mechanism from immediately above using the installation position holes as reference. Check that the boss of the mechanism state switch and the hole in the cam gear are aligned.

4) Push the terminal sections (shaded sections ▨) of the capstan and loading motors and check that they are inserted securely.

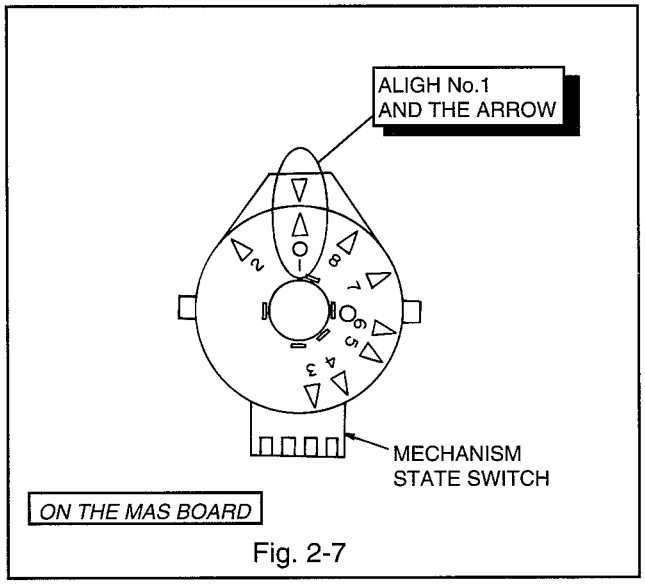


Fig. 2-7

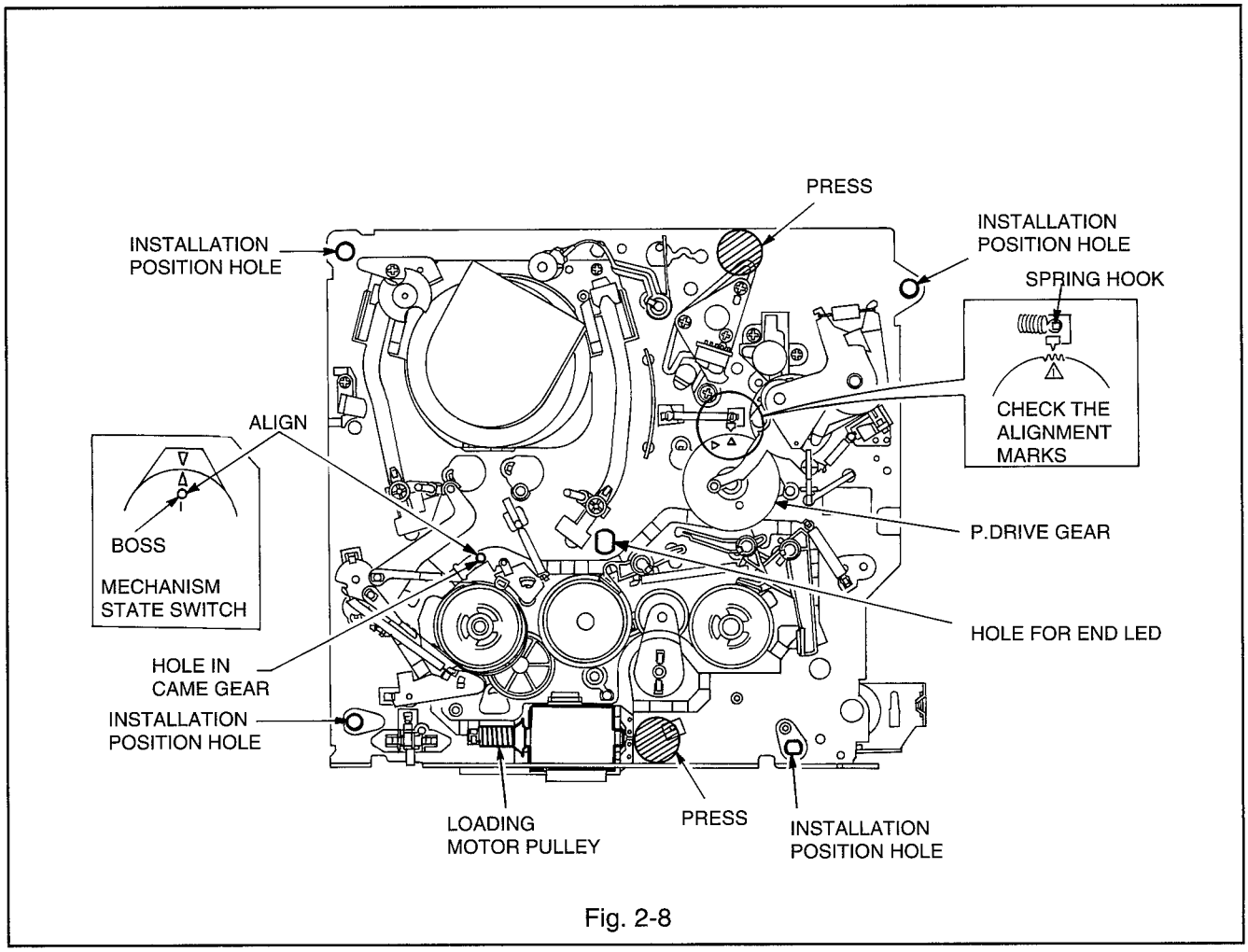


Fig. 2-8

MEMO

CHAPTER 3 ELECTRIC CIRCUIT ADJUSTMENT

Service Positions

1. Servicing position during electrical adjustment

Perform adjustment after removing the top cover, front panel and rear panel.

When the shield cover of the connector between the cylinder motor and MAS circuit boards is removed, noise appears in the played back picture. Attach the shield cover when checking the picture on the screen.

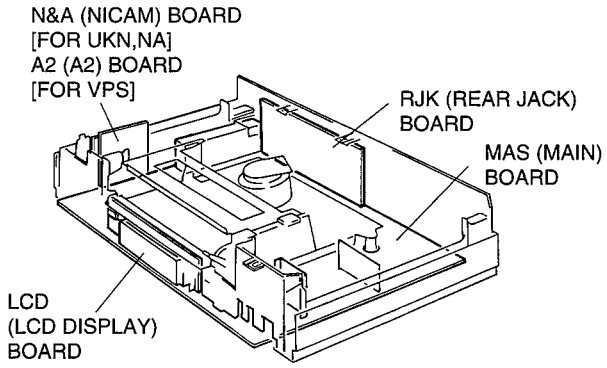


Fig. 1

2. Servicing positions when repairing and checking circuits

2-1. Procedure to set the LCD, and N&A or A2 boards to the servicing positions (Fig. 2)

1) Remove the top cover and front panel.
2) Remove the US-FL mechanism.
3) Remove the LCD board and front frame, then reattach the LCD board.
4) Check all boards from the pattern side, shown by the arrow.

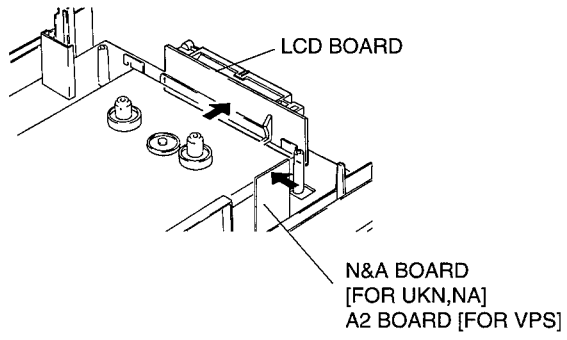


Fig. 2

2-2. Procedure to set the MAS and RJK boards to the servicing position (Fig. 3)

1) Remove the top cover, front panel and rear panel.
2) Remove the US-FL mechanism and front frame.
3) Remove the MAS and RJK boards, with the each board and the US mechanism assembled, from the frame.
4) Turn over the MAS board and perform checks from the pattern side indicated by the arrow.
   Be careful of the following at this time.
   • Lay out an insulation sheet under the boards.
   • Attach the shield cover at the rear of the cylinder.
   Attach the US-FL mechanism when loading the tape.

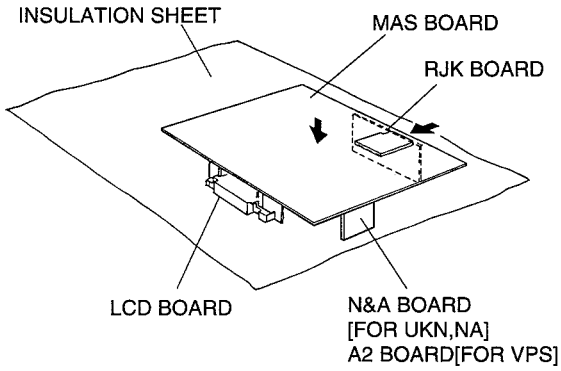


Fig. 3

3. Be careful of electric shocks

The power supply block on the right of the VCR has a heat sink which generates a high voltage. "HIGH VOLTAGE" is printed on the heat sink. Take great care when handling this heat sink when the power is turned on during servicing.

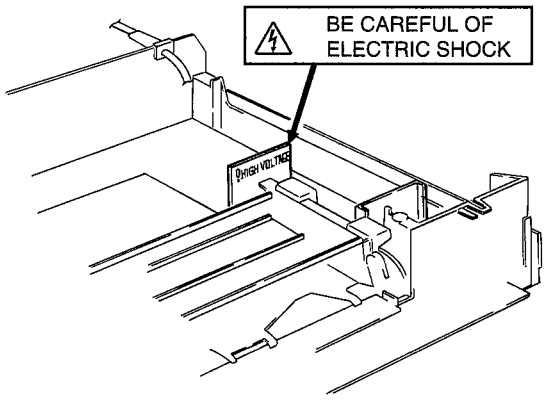


Fig. 4

1. Test equipment/jigs necessary for adjustment

1) Dual-trace oscilloscope
2) Colour bar generator
3) Voltmeter
4) Monitor TV (with A/V jacks)
5) Alignment tapes:
   MH-2: Part No. 7099052
   24HMAF-2: Part No. 7099175
   (Hi-Fi alignment tape)
6) Blank tape
7) C/R oscillator

2. Cautions on adjustment

1) The following conditions apply when otherwise not specified.
   Probe of oscilloscope: 10:1
   Synchronization of oscilloscope: Internal sync
   Ground of test equipment: PG2508 pin 6
   (on MAS board)
2) When performing more than one adjustment, follow the specified order.

3. Tips for adjustment

3-1.Procedure to reset the main microprocessor

The main microprocessor is not reset even when the power cord is unplugged from the AC outlet because its power is backed up by a backup circuit. Press S708 on the MAS board to reset the entire microprocessor. Do not press the reset switch with the power cord unplugged from the AC outlet as the slow tracking preset value could drift. If the preset value drifts, plug the power cord into an AC outlet and press the reset switch again with the power turned on. It is recommended that you press the reset switch after reinstalling the front panel.

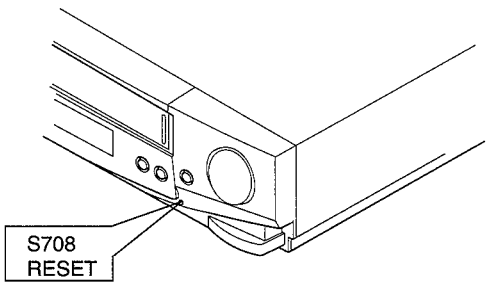


Fig. 5

3-2. Procedure to switch off the blue background function

1) Press the "GUIDE" button of the remote control to display the menu on the monitor TV screen.
2) Press 2 to select the VCR setup screen.
3) Press 1 to specify blue background off.

3-3. Procedure to obtain the LP head playback mode (X-value adjustment test mode)

Press the TRACKING UP(▲) and DOWN(▼) buttons of the remote control provided simultaneously when an alignment tape is being played and hold them, then press the "CHANNEL ▽" button on the VCR; The VCR enters the LP head playback mode (X-value adjustment test mode).

4. Connections of test equipment

Connect the test equipment as follows when otherwise not specified.

1) Connect a colour bar generator to the video input jack of the VCR.
2) Connect a monitor TV to the Euro Socket of the VCR.
3) Connect an antenna to the antenna jack and receive a TV broadcast (only for sound multiplex adjustment).

5. Test Points and Adjustment Points

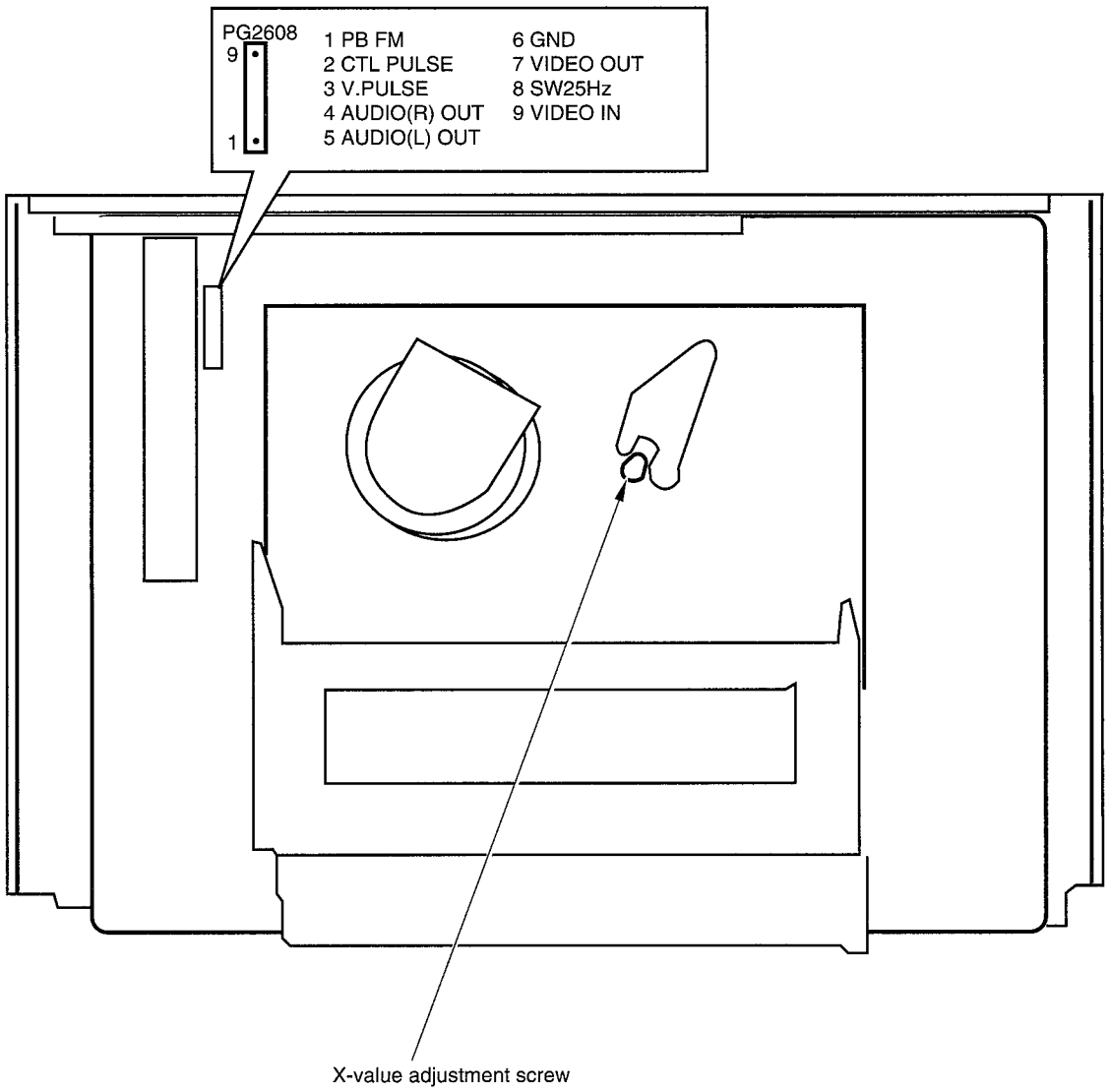


Fig. 6 MAS (Main) Circuit Board [Components Side]

6. Servo Circuit Adjustments

6-1. Switching point adjustment (Fig. 6)

Purpose:
To set the switching point of the video heads during playback to the center where the CH-1 and CH-2 envelopes overlap each other.

Fault due to incomplete adjustment:
Vertical sync signal is degraded and vertical jitter occurs.
Switching noise appears across the bottom of the screen.

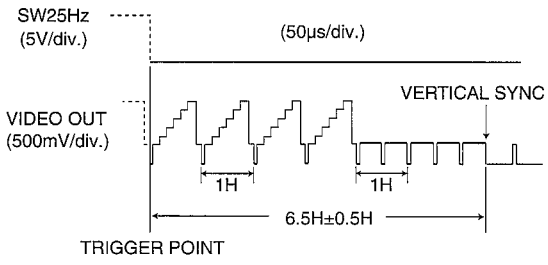
Test Equipment/Jigs and Connection Points
Oscilloscope CH-1: PG2508-7(VIDEO OUT)
CH-2: PG2508-8(SW25Hz)
Alignment tape (MH-2)

State of VCR
1) Play the alignment tape
2) Set to the X-value adjustment test mode.

Adjustment Point
F.FWD button(S702)
REW button(S703)

Adjustment Procedure
1) Play the alignment tape.
2) Press the "TRACKING ▲ "and "TRACKING ▼ " buttons of the remote control provided simultaneously and hold them, then press the "CHANNEL ▽ " button of the VCR to set the VCR to the test mode. (SP is switched to LP in the display.)
3) Press the "F.FWD" and "REW" buttons of the VCR to set so the phase from the verticalsync to the trailing edge (trigger position) of the SW25Hz pulse is set to 6.5H±0.5H
4) Press the "STOP" button to release the test mode.

Waveforms



<Conditions of oscilloscope>
Trigger with CH-2.
Set the sync slope to "-".

6-2. X-value adjustment (Fig. 6)

Purpose:
To ensure compatibility with other VCRs.

Fault due to incomplete adjustment:
When a tape recorded by another VCR is played back, the tracking is not optimized and noise appears on the screen.

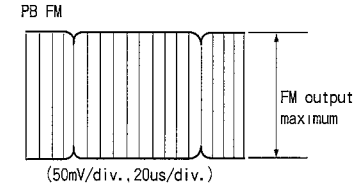
Test Equipment/Jigs and Connection Points
Oscilloscope CH-1: PG2508-1 (PB FM)
CH-2: PG2508-8 (SW25Hz)
Alignment tape (MH-2)

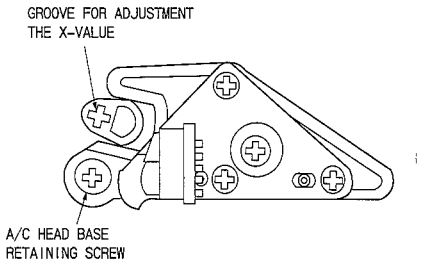
State of VCR
1) Play the alignment tape.
2) Set to the X-value adjustment test mode.

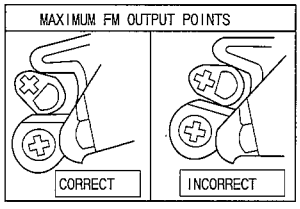
Adjustment Point
Groove for the adjustment X-value

Adjustment Procedure
1) Play the alignment tape.
2) Press the "TRACKING ▲ "and "TRACKING ▼ " buttons of the remote control provided simultaneously and hold them, then press the "CHANNEL ▽ " button of the VCR to set the VCR to the test mode. (SP is switched to LP in the display.)
3) Loosen the screw holding the A/C head base (do not loosen it excessively).
4) Insert a screwdriver into the groove for adjusting the X-value and adjust so the FM output is maximum. There are two maximum FM output points when the groove for adjusting the X-value is turned. Adjust the FM output to a maximum when the groove is at the correct position as shown in the figure below.
5) Press the "STOP" button to release the test mode.

Waveforms







Servo Circuit Adjustments

6-3. Vertical jitter adjustment

Purpose:
To suppress vertical jitter during slow and still play.

Fault due to incomplete adjustment:
Vertical jitter appears in the picture during slow and still play.

Test Equipment/Jigs and Connection Points
Monitor TV : PG2508-7(VIDEO OUT)
Color bar generator: PG2508-9(VIDEO IN)
Blank tape

State of VCR
Record a color bar signal and play it using the same VCR.

Adjustment Point
TRACKING ▲ (Remote control)
TRACKING ▼ (Remote control)

Adjustment Procedure
<LP vertical jitter correction>. Record in the LP mode and play it back using the same VCR.
1) Press the "PAUSE" button to set the VCR to the still play mode.
2) Use the "TRACKING ▲ " or "TRACKING ▼ " buttons of the remote control to suppress vertical jitter of the picture.

<SP vertical jitter correction>: Record in the SP mode and play it back using the same VCR.
1) Press the "PAUSE" button to set the VCR to the still play mode.
2) Use the "TRACKING ▲ " or "TRACKING ▼ " buttons of the remote control to suppress vertical jitter in the picture.

6-4. Forward slow tracking preset adjustment

Purpose:
To adjust the timing with which the brake pulse of the capstan motor is generated during slow play so that noise is minimum.

Fault due to incomplete adjustment:
Noise appears during slow play and the picture is not clear.

Test Equipment/Jigs and Connection Points
Monitor TV : PG2508-7(VIDEO OUT)
Color bar generator: PG2508-9(VIDEO IN)
Blank tape (E-180)

State of VCR
Slow tracking: Unplug the power cord to set the slow tracking to the center.

Adjustment Point
TRACKING ▲ (Remote control)
TRACKING ▼ (Remote control)

Adjustment Procedure
1) Record a signal on the middle of a E-180 blank tape in the LP mode and play it back using the same VCR.
2) Press the "TRACKING ▲ " and "TRACKING ▼ " buttons of the remote control (provided) simultaneously during playback and hold them, then press the "PLAY" button to set the VCR to the forward test slow mode.
3) Use the "TRACKING ▲ " or "TRACKING ▼ " buttons so the slow feed noise appears across the bottom of the monitor screen and then it is driven out from the bottom of the screen.
4) Check that no noise appears on the monitor screen.
5) Press the "PLAY" button to return the VCR to the playback mode (the preset data is written to the EEPROM).
6) Perform the same procedure to perform slow tracking preset adjustment in the SP mode.
Do not press the reset switch after adjustment when the power is not turned on as the preset value could drift. If the preset value drifts, turn the power on and press the reset switch again for recovery.

6-5. Reverse slow tracking preset adjustment

Purpose:
To adjust the timing with which the brake pulse of the capstan motor is generated during reverse slow play so that noise is minimum.

Fault due to incomplete adjustment:
Noise appears during reverse slow play and the picture is not clear.

Test Equipment/Jigs and Connection Points
Monitor TV : PG2508-7(VIDEO OUT)
Color bar generator: PG2508-9(VIDEO IN)
Blank tape (E-180)

State of VCR
Slow tracking: Unplug the power cord to set the slow tracking to the center.

Adjustment Point
TRACKING ▲ (Remote control)
TRACKING ▼ (Remote control)

Adjustment Procedure
1) Record a signal on the middle of a E-180 blank tape in the LP mode and play it back using the same VCR.
2) Press the "TRACKING ▲ " and "TRACKING ▼ " buttons of the remote control (provided) simultaneously during still play and hold them, then press the "PLAY" button to set the VCR to the reverse test slow mode.
3) Use the "TRACKING ▲ " or "TRACKING ▼ " buttons so the slow feed noise appears across the bottom of the monitor screen and then it is driven out from the bottom of the screen.
4) Check that no noise appears on the monitor screen.
5) Press the "PLAY" button to return the VCR to the playback mode (the preset data is written to the EEPROM).
6) Perform the same procedure to perform reverse slow tracking preset adjustment in the SP mode.
Do not press the reset switch after adjustment when the power is not turned on as the preset value could drift. If the preset value drifts, turn the power on and press the reset switch again for recovery.

7. Audio Circuit Adjustments

7-1. Hi-Fi audio playback level check

Purpose:
To set the playback level of the Hi-Fi audio signal to the specified value.

Fault due to incomplete adjustment:
The appropriate volume cannot be obtained during playback.

Test Equipment/Jigs and Connection Points
Voltmeter
When checking L-CH:PG2508-5
When checking R-CH:PG2508-4
Hi-Fi alignment tape (24HMAF-2)

State of VCR
Play Hi-Fi alignment tape.

Adjustment procedure
Use the same checking procedure for both the L and R channels.
Check that the voltmeter reads -7.8dBs ± 3.0dBs.
If it cannot be confirmed, check the playback signal system.

7-2. E-E audio level check

Purpose:
To check the audio level in the E-E mode.

Fault due to incomplete adjustment:
To sound is abnormal in the E-E mode.

Test Equipment/Jigs
1) C/R oscillator: Audio in jack(L-CH)
Audio in jack(R-CH)
2) Voltmeter: Audio out jack(L-CH)
Audio out jack(R-CH)

State of VCR
E-E mode

Adjustment procedure
1) Apply a 1kHz, -7.8dBs sinewave signal to the audio input 1 (L-CH and R-CH).
2) Check that the voltmeter reads -6.8dBs±2.0dBs.
3) If the above cannot be confirmed, check the E-E audio line.

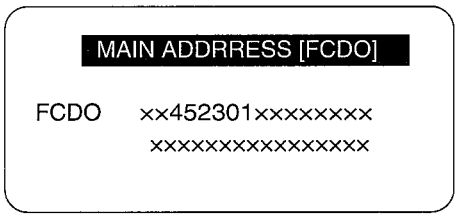
8. Cylinder Rotation Accumulated Hours of Usage Display

Display
This VCR has a function which displays the accumulated hours of cylinder rotation as a reference for replacing the cylinder.

1. Method for display
simultaneously holding down the "VCR channel ▲" and "VCR channel ▼" buttons on the provided remote control, with power ON and without a cassette inserted, press the "channel up" button on the VCR. When power is turned off, the display will disappear.

2. Clearing the accumulated hours
Same as for shipment mode initial setting.

3. Example of displau [In case of 12,345 hours]



VCR DISPLAY

9. List of Data in EEPROM and Initial Settings

The table below lists the data stored in ROM. It also shows the data set by shipment mode initialization, when the trouble display is cleared.

Information	Data memory ROM		List of initial data			Remarks
	IC903 VCR EEPROM	IC4302 NAVI EEPROM	Shipment mode initial data	Tape navi, map initial data	Clearing of trouble display	
Channel memory	Yes	No	Yes	No	No	
VCR mode select data	Yes	No	Yes	No	No	
Trouble display data	Yes	No	Yes	No	Yes	
Slow tracking data	Yes	No	No (set by adj.)	No	No	
Artificial V sync data	Yes	No	No (set by adj.)	No	No	
Switching point data	Yes	No	No (set by adj.)	No	No	
SAT data	Yes	No	Yes	No	No	
Tape navigation map data	No	Yes	No	Yes	No	

10. List of Hidden Commands

The following tables list the mode setting commands during adjustment and EEPROM initial setting commands.

10-1. Mode setting commands during adjustment

Item	Mode in which command is accepted	Operation	Remarks
Tracking center	Play	Press the tracking up(▲) and down(▼) buttons of the remote control simultaneously.	
X-value adjustment test mode	Play	Press the tracking up(▲) and down(▼) buttons of the remote control simultaneously and press the "CHANNEL ▽ "button on the VCR.	
Forward test slow mode	Play	Press the tracking up(▲) and down(▼) buttons of the remote control simultaneously and press the "PLAY" button on the VCR.	
Reverse test slow mode	Still play	Press the tracking up(▲) and down(▼) buttons of the remote control simultaneously and press the "PLAY" button on the VCR.	

10-2. EEPROM initialization commands

Item	Mode in which command is accepted	Operation	Remarks
Shipment mode initial setting	EJECT	Press the "REC" buttons on the VCR and hold it, then press the "RESET" button used to initialize the microprocessor.	Hold the "REC" button depressed and release it after the display lights.
Clearing of trouble display	_____	Press the "PLAY" button on the VCR and hold it, then press the "RESET" button used to initialize the microprocessor.	Hold the "PLAY" button depressed and release it after the display lights.

11. Caution When Replacing IC903 (EEPROM)

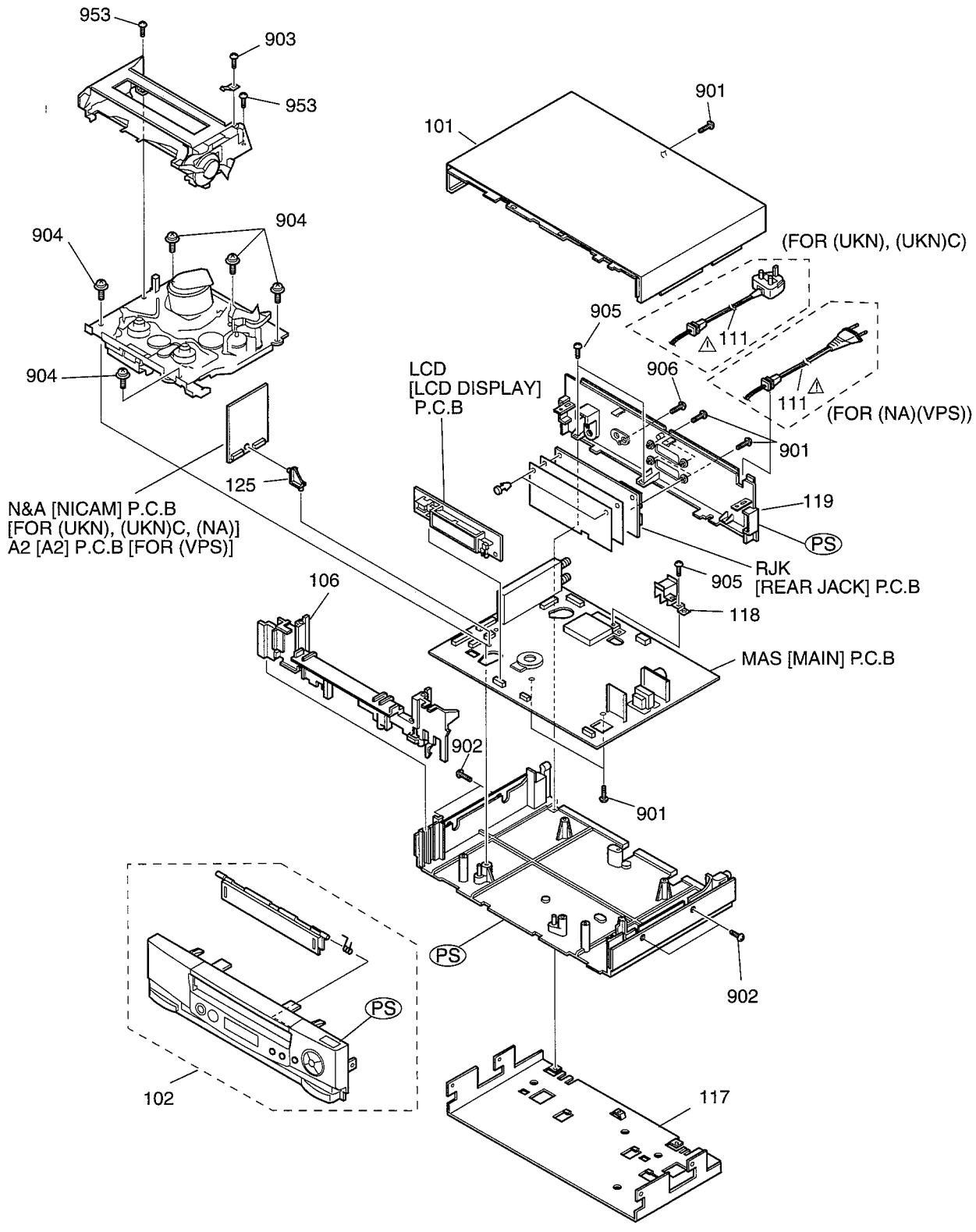
After replacing IC903 (EEPROM), execute the VCR initial settings and then perform the following adjustments.

	Adjustment	Page
1	Switching point adjustment	P3-5
2	Vertical jitter adjustment	P3-6
3	Forward slow tracking adjustment	P3-6
4	Reverse slow tracking adjustment	P3-6

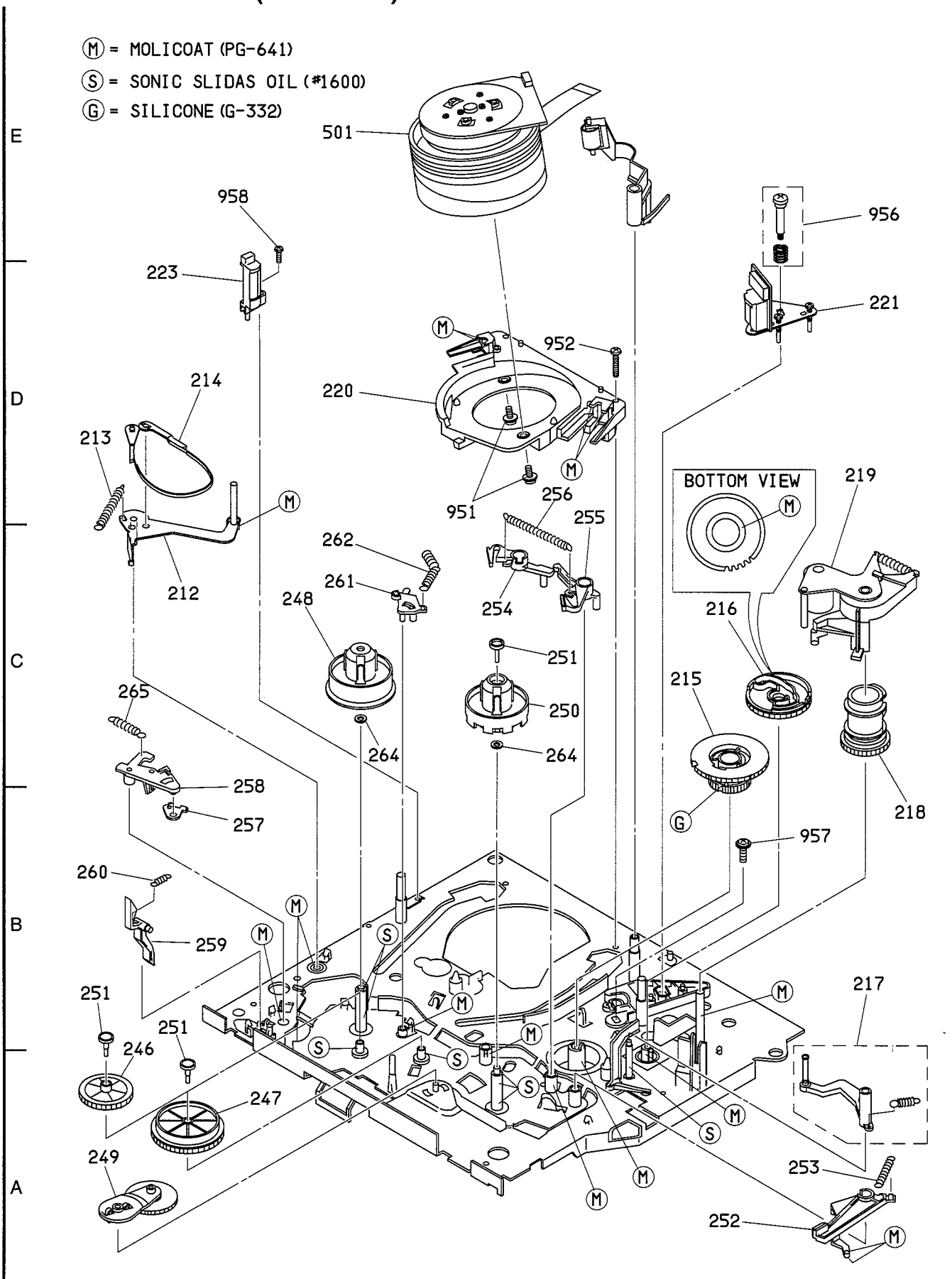
CHAPTER 4 EXPLODED VIEW

1. CABINET SECTION

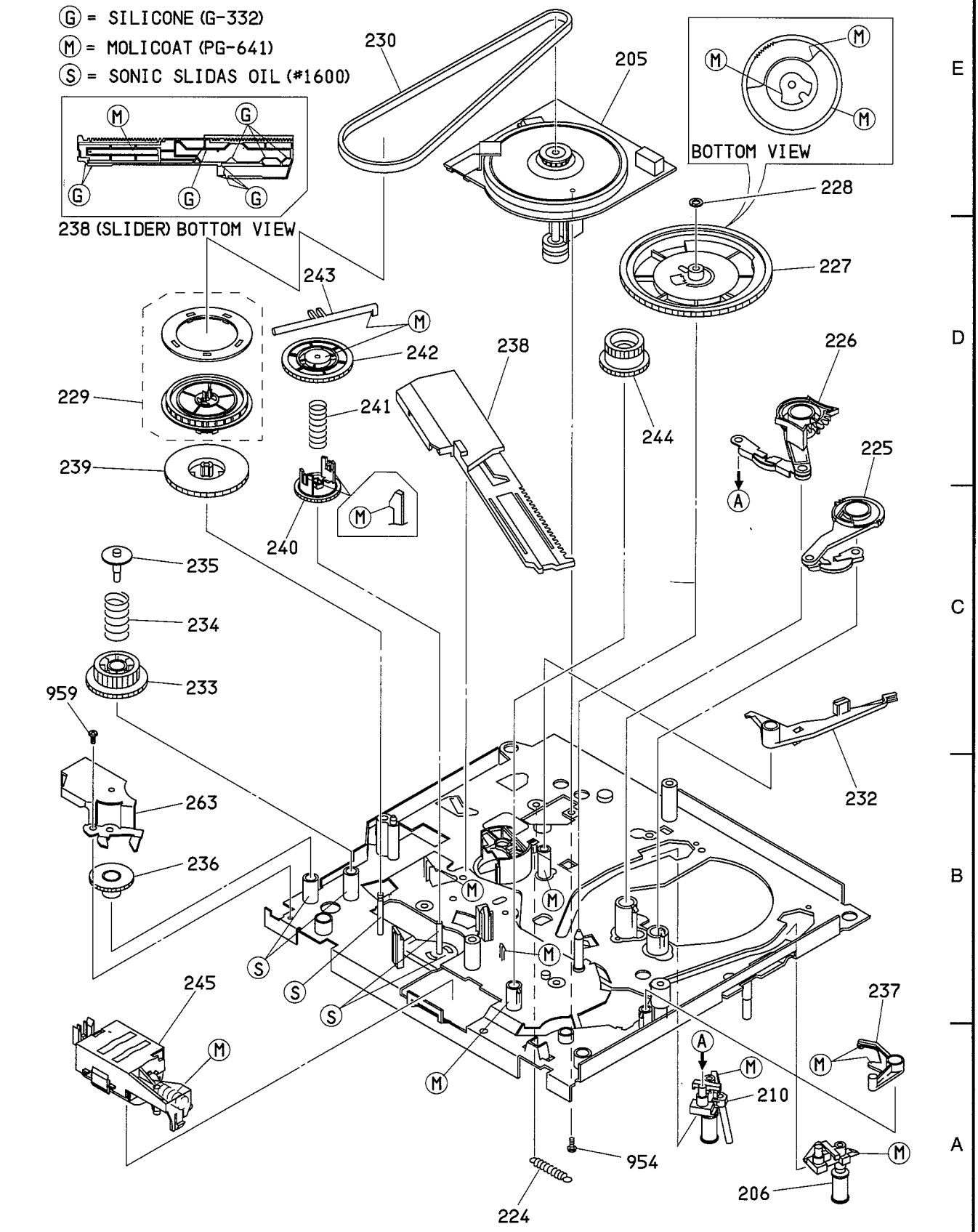
NOTE: The synthetic resin members that can be dismantled are shown by abbreviations using letters.



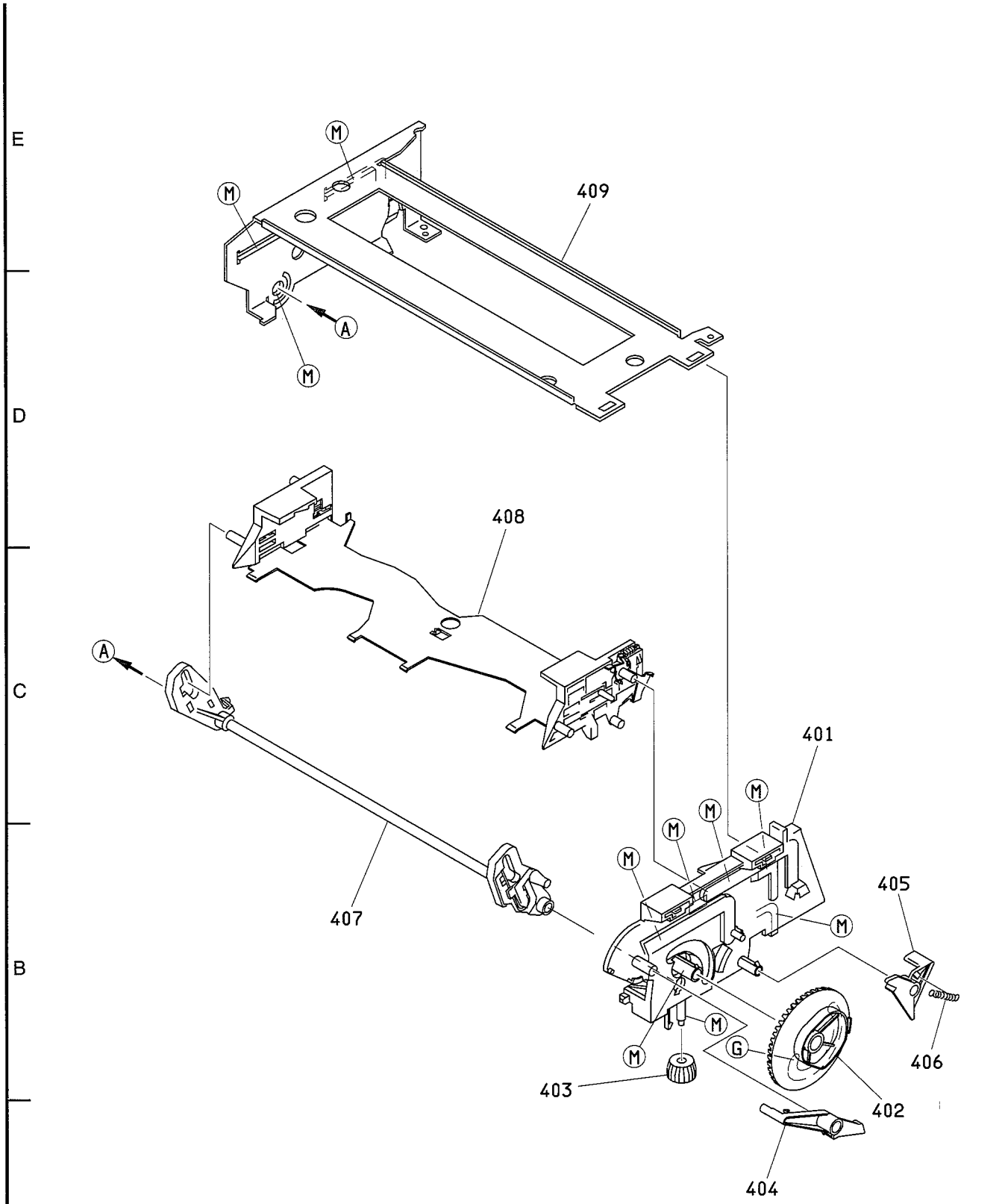
2. US-MECHANISM (TOP VIEW)SECTION



3. US-MECHANISM (BOTTOM VIEW)SECTION



4. US-FL MECHANISM SECTION



CHAPTER 5 REPLACEMENT PARTS LIST

1. MECHANICAL PARTS LIST

SYMBOL NO	P-NO	DESCRIPTION	
		MECHANISM SECTION	
101	QA11931	COVER,TOP (HEPM)	
102	PH20381	PANEL,FRONT (HEPM)	[(UKN)]
102	PH20382	PANEL,FRONT (HEPM)	[(NA),(VPS)]
102	PH20383	PANEL,FRONT (HEPM)	[(UKN)C]
106	NT10486	PIECE,FRONT (HEPM)	
⚠111	EV10541	AC CORD (HEPM)	[(NA),(VPS)]
⚠111	EV10551	CORD,POWER (HEPM)	[(UKN),(UKN)C]
117	QA11154	COVER,BOTTOM(HEPM)	
118	MD11281	COVER,CBA	
119	PH13723	PANEL,REAR (HEPM)	
125	6810651	HOLDER,CBA	
205	GP10255	MOTOR,CAPSTAN	
206	KX12294	BASE,GUIDE ROLLER (I)	
210	KX12302	BASE,GUIDE ROLLER(O)	
212	KX11531	ARM,TENSION	
213	KL10662	SPRING	
214	KX11631	BAND,TENSION	
215	KF10641	GEAR,DRIVE	
216	KF12281	GEAR,IDLER	
217	KX12662	ARM,OUT	
218	KX11581	GEAR,SPIRAL	
219	KX11602	ARM,PINCH ROLLER	
220	KX11451	BASE,CYLINDER	
221	KX11944	AC HEAD	
223	5423082	FE HEAD	
224	KL10711	SPRING	
225	KX17881	GEAR,LOADING(L)	
226	KX17891	GEAR,LOADING(R)	
227	KF10673	GEAR,CAM	
228	4344643	WASHER	
229	KX17581	PULLEY	
230	KX18201	BELT	
232	KX12031	BRAKE	
233	KF10571	GEAR,CHANGE	
234	KL10771	SPRING	
235	KX12001	STOPPER,SPRING	
236	KF10561	GEAR,IDLER	
237	KX11831	ARM,OPERATION	
238	KX11362	SLIDER	
239	KF10551	GEAR,TRANS	
240	KF10501	GEAR,DRIVE	
241	KL10773	SPRING	
242	KF10513	GEAR,CHANGE	
243	KX11411	ARM,CHANGE	
244	KX11371	GEAR	
245	KX11892	MOTOR,LOADING	
246	KF10521	GEAR,IDLER 1	
247	KF10532	GEAR,IDLER 2	
248	KH10152	REEL,TABLE(S)	
249	KX11423	ARM	
250	KH10161	REEL,TABLE(T)	
251	KX11991	STOPPER	
252	KX11861	BRAKE	
253	KL10782	SPRING,BRAKE	
254	KX11875	BRAKE,L	
255	KX11883	BRAKE,R	
256	KL10792	SPRING,BRAKE	
257	KF10542	GEAR,JOG	
258	KX13132	ARM,JOG	
259	KX11841	ARM,REC	
260	6542485	SPRING	
261	KX11811	BRAKE,SUB	
262	KL10903	SPRING,SUB	
263	KX12461	BRACKET,BASE	
264	MN11571	WASHER	
265	KL11062	SPRING,JOG	
401	KX11773	BRACKET (R)	
402	KF10682	GEAR 1	
403	KF10691	GEAR 2	
404	KX11753	ARM,DOOR	
405	KX11761	ARM,SWITCH	
406	6323723	SPRING	
407	KX11931	ARM,DRIVE	
408	KX21211	HOLDER,CASSETTE	
409	KX21261	BRACKET(L)	
501	HX10292	CYLINDER ASSY (CY-U6S1)	
901	8699412	SCREW (3X12) BLACK	
902	MK11863	SCREW (M3X8)	
903	MK11865	SCREW (M2.6X6)	
904	7781132	BT SCREW	
905	MK11871	SCREW (3X8)	
951	8652408	SCREW (PSW3X8)	
952	0671310	DT SCREW-2.6MMDX10MM	
953	8671306	SCREW (2.6X6)	
954	8691306	BT SCREW 2.6MM	
956	KX12443	SCREW	
957	MJ10341	SCREW (M2.6)	
958	0671308	DT SCREW-2.6MMDX8MM	
959	0671305	DT SCREW-2.6MMDX5MM	
		ACCESSARIES	
802	HL11174	REMOTE HAND SET(VT-RM801ES)(HEPM)	[(NA),(VPS)]
802	HL11173	REMOTE HAND SET(VT-RM801EV)(HEPM)	[(UKN),(UKN)C]
803	EW12181	CARD, RF (HEPM)	

2. ELECTRICAL PARTS LIST

SYMBOL NO	P-NO	DESCRIPTION
		MAS BOARD
		CAPACITORS
C0201	0893008	CERAMIC CHIP 0.1UF+-10% 16V
C0202	0893044	CERAMIC CHIP 0.01UF+-10% 50V
C0203	0890046	CERAMIC DISC 0.1UF+80-20% 50V
C0206	0800178	ELECTROLYTIC 4.7UF 35V
C0207	0893091	CERAMIC CHIP 0.022UF+-10% 16V
C0208	0893044	CERAMIC CHIP 0.01UF+-10% 50V
C0209	0893044	CERAMIC CHIP 0.01UF+-10% 50V
C0211	0800138	ELECTROLYTIC 47UF 6.3V
C0213	0254458	ELECTROLYTIC 3.3UF+-20% 50V
C0214	0893008	CERAMIC CHIP 0.1UF+-10% 16V
C0215	0800138	ELECTROLYTIC 47UF 6.3V
C0216	0209948	CERAMIC CHIP 330PF+-5% 50V
C0218	0800179	ELECTROLYTIC 10UF 16V
C0219	0893044	CERAMIC CHIP 0.01UF+-10% 50V
C0220	0890043	CERAMIC DISC 0.01UF+-20% 16V
C0221	0800112	ELECTROLYTIC 2.2UF 50V
C0222	0893039	CERAMIC CHIP 4700PF+-10% 50V
C0223	0800118	ELECTROLYTIC 4.7UF 35V
C0224	0800122	ELECTROLYTIC 10UF 16V
C0226	0893091	CERAMIC CHIP 0.022UF+-10% 16V
C0227	0800107	ELECTROLYTIC 0.47UF 50V
C0228	0893008	CERAMIC CHIP 0.1UF+-10% 16V
C0230	0893002	CERAMIC CHIP 0.033UF+-10% 16V
C0233	0800179	ELECTROLYTIC 10UF 16V
C0234	0800185	ELECTROLYTIC 47UF 6.3V
C0235	0893008	CERAMIC CHIP 0.1UF+-10% 16V
C0236	0893044	CERAMIC CHIP 0.01UF+-10% 50V
C0237	0893008	CERAMIC CHIP 0.1UF+-10% 16V
C0238	0800176	ELECTROLYTIC 2.2UF 50V
C0241	0207444	ELECTROLYTIC 1.0UF 50V
C0242	0800179	ELECTROLYTIC 10UF 16V
C0243	0893008	CERAMIC CHIP 0.1UF+-10% 16V
C0244	0893008	CERAMIC CHIP 0.1UF+-10% 16V
C0245	0800115	ELECTROLYTIC 3.3UF 50V
C0246	0893008	CERAMIC CHIP 0.1UF+-10% 16V
C0247	0893008	CERAMIC CHIP 0.1UF+-10% 16V
C0249	0893008	CERAMIC CHIP 0.1UF+-10% 16V
C0250	0209937	CERAMIC CHIP 39PF+-5% 50V
C0251	0893008	CERAMIC CHIP 0.1UF+-10% 16V
C0255	0209943	CERAMIC CHIP 120PF+-5% 50V
C0256	0209930	CERAMIC CHIP 10PF+-0.5% 50V
C0257	0209925	CERAMIC CHIP 5PF+-0.25% 50V
C0259	0893008	CERAMIC CHIP 0.1UF+-10% 16V
C0262	0893008	CERAMIC CHIP 0.1UF+-10% 16V
C0270	0893008	CERAMIC CHIP 0.1UF+-10% 16V
C0273	0209935	CERAMIC CHIP 27PF+-5% 50V
C0277	0209950	CERAMIC CHIP 470PF+-5% 50V
C0278	0209936	CERAMIC CHIP 33PF+-5% 50V
C0291	0893031	CERAMIC CHIP 1000PF+-10% 50V
C0292	0893044	CERAMIC CHIP 0.01UF+-10% 50V
C0293	0893044	CERAMIC CHIP 0.01UF+-10% 50V
C0296	0893044	CERAMIC CHIP 0.01UF+-10% 50V
C0297	0893044	CERAMIC CHIP 0.01UF+-10% 50V
C0402	0800117	ELECTROLYTIC 4.7UF 25V
C0403	0800185	ELECTROLYTIC 47UF 6.3V
C0404	0893044	CERAMIC CHIP 0.01UF+-10% 50V
C0405	0800117	ELECTROLYTIC 4.7UF 25V
C0406	0893035	CERAMIC CHIP 2200PF+-10% 50V
C0407	0800122	ELECTROLYTIC 10UF 16V
C0408	0800122	ELECTROLYTIC 10UF 16V
C0409	0893031	CERAMIC CHIP 1000PF+-10% 50V
C0410	0893044	CERAMIC CHIP 0.01UF+-10% 50V
C0411	0800175	ELECTROLYTIC 1.0UF 50V
C0413	0893008	CERAMIC CHIP 0.1UF+-10% 16V
C0414	0800127	ELECTROLYTIC 22UF 10V
C0419	0800117	ELECTROLYTIC 4.7UF 25V
C0420	AN10332R	CAPACITOR 0.027UF+-5% 100V
C0421	0209946	CERAMIC CHIP 220PF+-5% 50V
C0422	0800145	ELECTROLYTIC 100UF 16V
C0424	0893044	CERAMIC CHIP 0.01UF+-10% 50V
C0427	0893037	CERAMIC CHIP 3300PF+-10% 50V
C0429	0893091	CERAMIC CHIP 0.022UF+-10% 16V
C0434	0209945	CERAMIC CHIP 180PF+-5% 50V
C0435	0209939	CERAMIC CHIP 56PF+-5% 50V
C0437	0800011	ELECTROLYTIC 4.7UF 35V
C0501	0800127	ELECTROLYTIC 22UF 10V
C0502	0800118	ELECTROLYTIC 4.7UF 35V
C0503	0800118	ELECTROLYTIC 4.7UF 35V
C0505	0800118	ELECTROLYTIC 4.7UF 35V
C0506	0800135	ELECTROLYTIC 33UF 16V
C0507	0893053	CERAMIC CHIP 0.047UF+-10% 50V
C0508	0800112	ELECTROLYTIC 2.2UF 50V
C0509	0800143	ELECTROLYTIC 100UF 6.3V
C0510	0893046	CERAMIC CHIP 0.015UF+-10% 50V
C0511	0893044	CERAMIC CHIP 0.01UF+-10% 50V
C0512	0893044	CERAMIC CHIP 0.01UF+-10% 50V
C0513	0800185	ELECTROLYITC 47UF 6.3V
C0514	0893013	CERAMIC CHIP 0.22UF+-10% 16V
C0517	0893044	CERAMIC CHIP 0.01UF+-10% 50V
C0518	0893046	CERAMIC CHIP 0.015UF+-10% 50V
C0519	0800143	ELECTROLYTIC 100UF 6.3V
C0520	0800112	ELECTROLYTIC 2.2UF 50V
C0521	0893044	CERAMIC CHIP 0.01UF+-10% 50V
C0522	0893053	CERAMIC CHIP 0.047UF+-10% 50V
C0523	0800118	ELECTROLYTIC 4.7UF 35V
C0525	0800178	ELECTROLYTIC 4.7UF 35V
C0526	0800118	ELECTROLYTIC 4.7UF 35V
C0527	0800118	ELECTROLYTIC 4.7UF 35V
C0528	AN00629R	CAPACITOR 0.027UF+-10% 50V
C0529	0800122	ELECTROLYTIC 10UF 16V
C0530	0800122	ELECTROLYTIC 10UF 16V
C0531	0800122	ELECTROLYTIC 10UF 16V
C0532	0800141	ELECTROLYTIC 47UF 16V
C0533	0893044	CERAMIC CHIP 0.01UF+-10% 50V
C0534	0800135	ELECTROLYTIC 33UF 16V
C0535	0893046	CERAMIC CHIP 0.015UF+-10% 50V
C0536	0893062	CERAMIC CHIP 1UF+80-20% 16V
C0601	0700047	CARBON FILM 3.3kOHM+-5% 1/8W
C0604	0893091	CERAMIC CHIP 0.022UF+-10% 16V
C0606	0893031	CERAMIC CHIP 1000PF+-10% 50V
C0607	0209938	CERAMIC CHIP 47PF+-5% 50V
C0608	0209942	CERAMIC CHIP 100PF+-5% 50V
C0609	0800179	CARBON FILM 3.3kOHM+-5% 1/8W
C0611	0893091	CERAMIC CHIP 0.022UF+-10% 16V
C0612	0800182	ELECTROLYTIC 22UF 16V
C0614	0893031	CERAMIC CHIP 1000PF+-10% 50V
C0615	0800042	ELECTROLYTIC 47UF 25V
C0621	0890038	CERAMIC DISC 3300PF+-20% 16V
C0623	0893044	CERAMIC CHIP 0.01UF+-10% 50V
C0624	0893091	CERAMIC CHIP 0.022UF+-10% 16V
C0701	0893053	CERAMIC CHIP 0.047UF+-10% 50V
⚠ C0851	AN10201S	FILM CAPACITOR 0.1UF+-20% 250V
⚠ C0852	AN10201S	FILM CAPACITOR 0.1UF+-20% 250V
⚠ C0857	AJ00584F	CERAMIC CAPACITOR 3300PF+-20% 125V
⚠ C0858	AJ00584F	CERAMIC CAPACITOR 3300PF+-20% 125V

SYMBOL NO	P-NO	DESCRIPTION
C0859	0800206	ELECTROLYTIC 47UF 35V
C0860	AN10401R	CAPACITOR 0.047UF+-10% 250V
C0862	AL10191	ELECTROLYTIC 82UF 400V (HEPM)
C0863	AJ10245R	CERAMIC CAPACITOR 2200PF+-10% 50V
C0865	1143005	CERAMIC CAPACITOR 220PF+-5% 1KV
C0866	0209950	CERAMIC CHIP 470PF+-5% 50V
C0871	0254403	CAPACITOR 22UF+-20% 50V
C0872	0254405	CAPACITOR 1000UF+-20% 25V
C0873	0800354	ELECTROLYTIC 470UF 25V
C0874	AL10481S	ELECTROLYTIC 3300UF 16V
C0875	0800352	ELECTROLYTIC 470UF 10V
C0876	0893044	CERAMIC CHIP 0.01UF+-10% 50V
C0877	1143001	CERAMIC CAPACITOR 56PF+-5% 1KV
C0881	0800135	ELECTROLYTIC 33UF 16V
C0882	0893053	CERAMIC CHIP 0.047UF+-10% 50V
C0883	0800009	ELECTROLYTIC 4.7UF 25V
C0884	0800015	ELECTROLYTIC 10UF 16V
C0885	0893062	CERAMIC CHIP 1UF+80-20% 16V
C0886	0893062	CERAMIC CHIP 1UF+80-20% 16V
C0887	0890045	CERAMIC DISC 0.047UF+80-20% 50V
C0896	0800122	ELECTROLYTIC 10UF 16V
C0902	0893044	CERAMIC CHIP 0.01UF+-10% 50V
C0903	0893053	CERAMIC CHIP 0.047UF+-10% 50V
C0904	0217516	CAPACITOR 0.047UF+80-20% 5.5V
C0905	0893008	CERAMIC CHIP 0.1UF+-10% 16V
C0906	0893062	CERAMIC CHIP 1UF+80-20% 16V
C0907	0209927	CERAMIC CHIP 7.0PF+-0.5% 50V
C0908	0209927	CERAMIC CHIP 7.0PF+-0.5% 50V
C0909	0209932	CERAMIC CHIP 15PF+-5% 50V
C0910	0209932	CERAMIC CHIP 15PF+-5% 50V
C0912	0893008	CERAMIC CHIP 0.1UF+-10% 16V
C0913	0893044	CERAMIC CHIP 0.01UF+-10% 50V
C0914MI	0800033	ELECTROLYTIC 33UF 25V
C0915	0893044	CERAMIC CHIP 0.01UF+-10% 50V
C0916	0893044	CERAMIC CHIP 0.01UF+-10% 50V
C0919	0893053	CERAMIC CHIP 0.047UF+-10% 50V
C0922	0893008	CERAMIC CHIP 0.1UF+-10% 16V
C0923	0893091	CERAMIC CHIP 0.022UF+-10% 16V
C0924	0209938	CERAMIC CHIP 47PF+-5% 50V
C0925	0209938	CERAMIC CHIP 47PF+-5% 50V
C0926	0209930	CERAMIC CHIP 10PF+-0.5% 50V
C0927	0893062	CERAMIC CHIP 1UF+80-20% 16V
C0940	0209938	CERAMIC CHIP 47PF+-5% 50V
C0941	0893062	CERAMIC CHIP 1UF+80-20% 16V
C0945	0893008	CERAMIC CHIP 0.1UF+-10% 16V
C0946	0893008	CERAMIC CHIP 0.1UF+-10% 16V
C0950	0893013	CERAMIC CHIP 0.22UF+-10% 16V
C0951	0893004	CERAMIC CHIP 0.047UF+-10% 16V
C0982	0893044	CERAMIC CHIP 0.01UF+-10% 50V
C1103	0893044	CERAMIC CHIP 0.01UF+-10% 50V
C1104	0893044	CERAMIC CHIP 0.01UF+-10% 50V
C1105	0893044	CERAMIC CHIP 0.01UF+-10% 50V
C1106	0800185	ELECTROLYTIC 47UF 6.3V
C1107	0893044	CERAMIC CHIP 0.01UF+-10% 50V
C1108	0893044	CERAMIC CHIP 0.01UF+-10% 50V
C1111	0893044	CERAMIC CHIP 0.01UF+-10% 50V
C1112	0800177	ELECTROLYTIC 3.3UF 50V
C1114	0893008	CERAMIC CHIP 0.1UF+-10% 16V
C1115	0890046	CERAMIC DISC 0.1UF+80-20% 50V
C1116	0893008	CERAMIC CHIP 0.1UF+-10% 16V
C1117	0890046	CERAMIC DISC 0.1UF+80-20% 50V
C1119	0893008	CERAMIC CHIP 0.1UF+-10% 16V
C1120	0893008	CERAMIC CHIP 0.1UF+-10% 16V
C1121	0893008	CERAMIC CHIP 0.1UF+-10% 16V
C1122	0893008	CERAMIC CHIP 0.1UF+-10% 16V

SYMBOL NO	P-NO	DESCRIPTION
C1124	0893031	CERAMIC CHIP 1000PF+-10% 50V
C1125	0800185	ELECTROLYTIC 47UF 6.3V
C1126	0890046	CERAMIC DISC 0.1UF+80-20% 50V
C1127	0209937	CERAMIC CHIP 39PF+-5% 50V
C1128	0209937	CERAMIC CHIP 39PF+-5% 50V
C1138	0209942	CERAMIC CHIP 100PF+-5% 50V
C1139	0209934	CERAMIC CHIP 22PF+-5% 50V
C1140	0893044	CERAMIC CHIP 0.01UF+-10% 50V
C1141	0209950	CERAMIC CHIP 470PF+-5% 50V
C1403	0800178	ELECTROLYTIC 4.7UF 35V
C1404	0893044	CERAMIC CHIP 0.01UF+-10% 50V
C1409	0209937	CERAMIC CHIP 39PF+-5% 50V
C1410	0209937	CERAMIC CHIP 39PF+-5% 50V
C1411	0209945	CERAMIC CHIP 180PF+-5% 50V
C1412	0800185	ELECTROLYTIC 47UF 6.3V
C1413	0893053	CERAMIC CHIP 0.047UF+-10% 50V
C1414	0800179	ELECTROLYTIC 10UF 16V
C1415	0800178	ELECTROLYTIC 4.7UF 35V
C1419	0209931	CERAMIC CHIP 12PF+-5% 50V
C1422	0209938	CERAMIC CHIP 47PF+-5% 50V
C1423	0800141	ELECTROLYTIC 47UF 16V
C1424	0893053	CERAMIC CHIP 0.047UF+-10% 50V
C1425	0209931	CERAMIC CHIP 12PF+-5% 50V
C1444	0209927	CERAMIC CHIP 7.0PF+-0.5% 50V
C2101	0893031	CERAMIC CHIP 1000PF+-10% 50V
C2102	0893031	CERAMIC CHIP 1000PF+-10% 50V
C2503	0800351	ELECTROLYTIC 470UF 6.3V
C2504	0893044	CERAMIC CHIP 0.01UF+-10% 50V
C2507	0800011	ELECTROLYTIC 4.7UF 35V
C2508	0893037	CERAMIC CHIP 3300PF+-10% 50V
C2509	0800041	ELECTROLYTIC 47UF 16V
C2513	0800325	ELECTROLYTIC 100UF 10V
C2515	0800139	ELECTROLYITC 47UF 10V
C2517	0893044	CERAMIC CHIP 0.01UF+-10% 50V
C2518	0800044	ELECTROLYTIC 47UF 50V
C2520	0800326	ELECTROLYTIC 100UF 16V
C2521	0800041	ELECTROLYTIC 47UF 16V
C2523	0893008	CERAMIC CHIP 0.1UF+-10% 16V
C2524	0893044	CERAMIC CHIP 0.01UF+-10% 50V
C2525	0893008	CERAMIC CHIP 0.1UF+-10% 16V
C2532	0893031	CERAMIC CHIP 1000PF+-10% 50V
C2533	0893031	CERAMIC CHIP 1000PF+-10% 50V
C2534	0207458	ELECTROLYTIC 10UF 25V
C2540	0893091	CERAMIC CHIP 0.022UF+-10% 16V
C2541	0893044	CERAMIC CHIP 0.01UF+-10% 50V
C2542	0893044	CERAMIC CHIP 0.01UF+-10% 50V
C2544	0893053	CERAMIC CHIP 0.047UF+-10% 50V
C2545	0800179	ELECTROLYTIC 10UF 16V
C2548	0893091	CERAMIC CHIP 0.022UF+-10% 16V

RESISTORS

R0212	0103851	CHIP RESISTOR 4.7KOHM+-5% 0.1W
R0213	0103851	CHIP RESISTOR 4.7KOHM+-5% 0.1W
R0215	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R0216	0103851	CHIP RESISTOR 4.7KOHM+-5% 0.1W
R0217	0103860	CHIP RESISTOR 27KOHM+-5% 0.1W
R0229	0103835	CHIP RESISTOR 220 OHM+-5% 0.1W
R0230	0103855	CHIP RESISTOR 10KOHM+-5% 0.1W
R0236	0103855	CHIP RESISTOR 10KOHM+-5% 0.1W
R0238	0103847	CHIP RESISTOR 2.2KOHM+-5% 0.1W
R0239	0103852	CHIP RESISTOR 5.6KOHM+-5% 0.1W
R0241	0103853	CHIP RESISTOR 6.8KOHM+-5% 0.1W
R0253	0103841	CHIP RESISTOR 680 OHM+-5% 0.1W
R0256	0103855	CHIP RESISTOR 10KOHM+-5% 0.1W

SYMBOL NO	P-NO	DESCRIPTION
R0258	0103835	CHIP RESISTOR 220 OHM+-5% 0.1W
R0261	0103851	CHIP RESISTOR 4.7KOHM+-5% 0.1W
R0264	0105515	CHIP RESISTOR 4.7MOHM+-5% 0.1W
R0269	0103834	CHIP RESISTOR 180 OHM+-5% 0.1W
R0284	0103879	CHIP RESISTOR 1MOHM+-5% 0.1W
R0402	0103860	CHIP RESISTOR 27KOHM+-5% 0.1W
R0407	0103834	CHIP RESISTOR 180 OHM+-5% 0.1W
R0408	0103861	CHIP RESISTOR 33KOHM+-5% 0.1W
R0409	0103873	CHIP RESISTOR 330KOHM+-5% 0.1W
R0410	0103855	CHIP RESISTOR 10KOHM+-5% 0.1W
R0413	0103861	CHIP RESISTOR 33KOHM+-5% 0.1W
R0414	0103855	CHIP RESISTOR 10KOHM+-5% 0.1W
R0418	0103851	CHIP RESISTOR 4.7KOHM+-5% 0.1W
R0419	0103861	CHIP RESISTOR 33KOHM+-5% 0.1W
R0420	0103860	CHIP RESISTOR 27KOHM+-5% 0.1W
R0421	0103859	CHIP RESISTOR 22KOHM+-5% 0.1W
R0422	0103812	CHIP RESISTOR 2.7 OHM+-10% 0.1W
R0423	0700058	CARBON FILM 22KOHM+-5% 1/8W
R0424	0103857	CHIP RESISTOR 15KOHM+-5% 0.1W
R0425	0103857	CHIP RESISTOR 15KOHM+-5% 0.1W
R0429	0103855	CHIP RESISTOR 10KOHM+-5% 0.1W
R0430	0103859	CHIP RESISTOR 22KOHM+-5% 0.1W
R0431	0103851	CHIP RESISTOR 4.7KOHM+-5% 0.1W
R0432	0103851	CHIP RESISTOR 4.7KOHM+-5% 0.1W
R0434	0103853	CHIP RESISTOR 6.8KOHM+-5% 0.1W
R0450	0103879	CHIP RESISTOR 1MOHM+-5% 0.1W
R0501	0103863	CHIP RESISTOR 47KOHM+-5% 0.1W
R0502	0103857	CHIP RESISTOR 15KOHM+-5% 0.1W
R0503	0103863	CHIP RESISTOR 47KOHM+-5% 0.1W
R0504	0103857	CHIP RESISTOR 15KOHM+-5% 0.1W
R0505	0103863	CHIP RESISTOR 47KOHM+-5% 0.1W
R0506	0103857	CHIP RESISTOR 15KOHM+-5% 0.1W
R0507	0103863	CHIP RESISTOR 47KOHM+-5% 0.1W
R0508	0103857	CHIP RESISTOR 15KOHM+-5% 0.1W
R0509	0103851	CHIP RESISTOR 4.7KOHM+-5% 0.1W
R0510	0104252	CHIP RESISTOR 510 OHM+-5% 0.1W
R0511	AQ10296R	CHIP RESISTOR 15KOHM+-0.1% 0.1W
R0512	AQ10295R	CHIP RESISTOR 11KOHM+-0.1% 0.1W
R0516	0103851	CHIP RESISTOR 4.7KOHM+-5% 0.1W
R0517	0104252	CHIP RESISTOR 510 OHM+-5% 0.1W
R0518	0700063	CARBON FILM 47KOHM+-5% 1/8W
R0519	0103857	CHIP RESISTOR 15KOHM+-5% 0.1W
R0520	0700063	CARBON FILM 47KOHM+-5% 1/8W
R0521	0103857	CHIP RESISTOR 15KOHM+-5% 0.1W
R0522	0700063	CARBON FILM 47KOHM+-5% 1/8W
R0523	0103857	CHIP RESISTOR 15KOHM+-5% 0.1W
R0524	0700063	CARBON FILM 47KOHM+-5% 1/8W
R0525	0700056	CARBON FILM 15KOHM+-5% 1/8W
R0526	0103839	CHIP RESISTOR 470 OHM+-5% 0.1W
R0527	0103839	CHIP RESISTOR 470 OHM+-5% 0.1W
R0528	0103857	CHIP RESISTOR 15KOHM+-5% 0.1W
R0529	0700063	CARBON FILM 47KOHM+-5% 1/8W
R0530	0700047	CARBON FILM 3.3KOHM+-5% 1/8W
R0531	0103844	CHIP RESISTOR 1.2KOHM+-5% 0.1W
R0532	0700052	CARBON FILM 6.8KOHM+-5% 1/8W
R0533	0103866	CHIP RESISTOR 82KOHM+-5% 0.1W
R0534	0700049	CARBON FILM 4.7KOHM+-5% 1/8W
R0602	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R0605	0103851	CHIP RESISTOR 4.7KOHM+-5% 0.1W
R0615	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R0616	0700072	CARBON FILM 220KOHM+-5% 1/8W
R0621	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R0622	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R0623	0103859	CHIP RESISTOR 22KOHM+-5% 0.1W
R0624	0103855	CHIP RESISTOR 10KOHM+-5% 0.1W
R0625	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R0629	0103837	CHIP RESISTOR 330 OHM+-5% 0.1W
R0630	0103837	CHIP RESISTOR 330 OHM+-5% 0.1W
R0631	0103870	CHIP RESISTOR 180KOHM+-5% 0.1W
R0632	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R0633	0103879	CHIP RESISTOR 1MOHM+-5% 0.1W
R0634	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R0635	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R0636	0893093	CERAMIC CHIP 2.2UF+80-20% 16V
R0637	0103850	CHIP RESISTOR 3.9KOHM+-5% 0.1W
R0703	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R0705	0103842	CHIP RESISTOR 820 OHM+-5% 0.1W
R0706	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R0707	0700041	CARBON FILM 1.0KOHM+-5% 1/8W
R0708	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R0709	0103835	CHIP RESISTOR 220 OHM+-5% 0.1W
R0715	0103845	CHIP RESISTOR 1.5KOHM+-5% 0.1W
R0716	0103846	CHIP RESISTOR 1.8KOHM+-5% 0.1W
R0717	0103833	CHIP RESISTOR 150 OHM+-5% 0.1W
R0718	0103831	CHIP RESISTOR 100 OHM+-5% 0.1W
R0719	0103845	CHIP RESISTOR 1.5KOHM+-5% 0.1W
R0720	0103857	CHIP RESISTOR 15KOHM+-5% 0.1W
R0721	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R0852	AT10211M	CHIP RESISTOR 1MOHM+-5% 1/2W
R0854	0116671	RESISTOR 100KOHM+-5% 3w
R0855	0116671	RESISTOR 100KOHM+-5% 3w
R0856	AT10261S	RESISTOR 220KOHM+-5% 2W
R0859	0103847	CHIP RESISTOR 2.2KOHM+-5% 0.1W
R0860	0103849	CHIP RESISTOR 3.3KOHM+-5% 0.1W
R0861	0700038	CARBON FILM 680 OHM+-5% 1/8W
R0862	AT10246S	RESISTOR 0.33 OHM+-5% 1W
R0863	0700021	CARBON FILM 33 OHM+-5% 1/8W
R0864	0103859	CHIP RESISTOR 22KOHM+-5% 0.1W
R0866	0700038	CARBON FILM 680 OHM+-5% 1/8W
R0867	0700032	CARBON FILM 220 OHM+-5% 1/8W
R0868	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R0869	0104114	CHIP RESISTOR 3.3KOHM+-1% 0.1W
R0870	0105572	METAL FILM RESISTOR 2.7KOHM+-1% 0.1W
R0871	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R0872	0103847	CHIP RESISTOR 2.2KOHM+-5% 0.1W
R0873	0103847	CHIP RESISTOR 2.2KOHM+-5% 0.1W
R0874	0700058	CARBON FILM 22KOHM+-5% 1/8W
R0875	0700035	CARBON FILM 390 OHM+-5% 1/8W
R0876	0103859	CHIP RESISTOR 22KOHM+-5% 0.1W
R0877	0103846	CHIP RESISTOR 1.8KOHM+-5% 0.1W
R0878	0103859	CHIP RESISTOR 22KOHM+-5% 0.1W
R0879	0103855	CHIP RESISTOR 10KOHM+-5% 0.1W
R0880	0103859	CHIP RESISTOR 22KOHM+-5% 0.1W
R0881	0103841	CHIP RESISTOR 680 OHM+-5% 0.1W
R0885	0700056	CARBON FILM 15KOHM+-5% 1/8W
R0886	0700056	CARBON FILM 15KOHM+-5% 1/8W
R0887	0700046	CARBON FILM 2.7KOHM+-5% 1/8W
R0888	AT10245S	RESISTOR 68 OHM+-5% 2W
R0889	0103859	CHIP RESISTOR 22KOHM+-5% 0.1W
R0890	0103859	CHIP RESISTOR 22KOHM+-5% 0.1W
R0891	0103859	CHIP RESISTOR 22KOHM+-5% 0.1W
R0892	0103867	CHIP RESISTOR 100KOHM+-5% 0.1W
R0893	0103859	CHIP RESISTOR 22KOHM+-5% 0.1W
R0894	0103859	CHIP RESISTOR 22KOHM+-5% 0.1W
R0895	0103859	CHIP RESISTOR 22KOHM+-5% 0.1W
R0896	0700058	CARBON FILM 22KOHM+-5% 1/8W
R0897	0103859	CHIP RESISTOR 22KOHM+-5% 0.1W
R0906	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R0907	0700051	CARBON FILM 5.6KOHM+-5% 1/8W

[(UKN),(UKN)C]

SYMBOL NO	P-NO	DESCRIPTION
R0907	0700063	CARBON FILM 47KOHM+-5% 1/8W [(NA),(VPS)]
R0908	CC10712R	DIODE SDC-UDZ2.0B
R0909	0103840	CHIP RESISTOR 560 OHM+-5% 0.1W
R0910	0103855	CHIP RESISTOR 10KOHM+-5% 0.1W
R0911	0103867	CHIP RESISTOR 100KOHM+-5% 0.1W
R0913	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R0914	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R0915	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R0916	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R0917	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R0918	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R0919	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R0920	0700054	CARBON FILM 10KOHM+-5% 1/8W
R0921	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R0922	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R0923	0700041	CARBON FILM 1.0KOHM+-5% 1/8W
R0924	0103840	CHIP RESISTOR 560 OHM+-5% 0.1W
R0925	0103840	CHIP RESISTOR 560 OHM+-5% 0.1W
R0926	0103840	CHIP RESISTOR 560 OHM+-5% 0.1W
R0928	0103851	CHIP RESISTOR 4.7KOHM+-5% 0.1W
R0929	0103851	CHIP RESISTOR 4.7KOHM+-5% 0.1W
R0934	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R0935	0103835	CHIP RESISTOR 220 OHM+-5% 0.1W
R0936	0103855	CHIP RESISTOR 10KOHM+-5% 0.1W
R0937	0103845	CHIP RESISTOR 1.5KOHM+-5% 0.1W
R0938	0103839	CHIP RESISTOR 470 OHM+-5% 0.1W
R0939	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R0940	0103839	CHIP RESISTOR 470 OHM+-5% 0.1W
R0943	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R0944	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R0945	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R0946	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R0947	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R0948	0103851	CHIP RESISTOR 4.7KOHM+-5% 0.1W
R0949	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R0957	0103879	CHIP RESISTOR 1MOHM+-5% 0.1W
R0960	0700063	CARBON FILM 47KOHM+-5% 1/8W
R0964	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R0965	0103867	CHIP RESISTOR 100KOHM+-5% 0.1W
R0967	0700041	CARBON FILM 1.0KOHM+-5% 1/8W
R0968	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R0976	0101725	CHIP RESISTOR 2.2 OHM+-5% 1/4W
R0977	0700067	CARBON FILM 100KOHM+-5% 1/8W
R0978	0101765	RESISTOR 10KOHM+-1% 1/8W
R0983	0103855	CHIP RESISTOR 10KOHM+-5% 0.1W
R0984	0103855	CHIP RESISTOR 10KOHM+-5% 0.1W
R0985	0103851	CHIP RESISTOR 4.7KOHM+-5% 0.1W
R0989	0103855	CHIP RESISTOR 10KOHM+-5% 0.1W
R0991	0103851	CHIP RESISTOR 4.7KOHM+-5% 0.1W
R0993	0103854	CHIP RESISTOR 8.2KOHM+-5% 0.1W
R0996	0103854	CHIP RESISTOR 8.2KOHM+-5% 0.1W
R0997	0103840	CHIP RESISTOR 560 OHM+-5% 0.1W
R0998	0103840	CHIP RESISTOR 560 OHM+-5% 0.1W
R0999	0103855	CHIP RESISTOR 10KOHM+-5% 0.1W
R1103	0103820	CHIP RESISTOR 12 OHM+-5% 0.1W
R1104	0103831	CHIP RESISTOR 100 OHM+-5% 0.1W
R1120	0103839	CHIP RESISTOR 470 OHM+-5% 0.1W
R1121	0103850	CHIP RESISTOR 3.9KOHM+-5% 0.1W
R1409	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R1410	0103846	CHIP RESISTOR 1.8KOHM+-5% 0.1W
R1412	0103875	CHIP RESISTOR 470KOHM+-5% 0.1W
R1414	0103859	CHIP RESISTOR 22KOHM+-5% 0.1W
R1416	0103847	CHIP RESISTOR 2.2KOHM+-5% 0.1W
R1418	0103831	CHIP RESISTOR 100 OHM+-5% 0.1W
R1421	0103835	CHIP RESISTOR 220 OHM+-5% 0.1W

SYMBOL NO	P-NO	DESCRIPTION
R1423	0700038	CARBON FILM 680 OHM+-5% 1/8W
R1424	0103840	CHIP RESISTOR 560 OHM+-5% 0.1W
R1429	0103847	CHIP RESISTOR 2.2KOHM+-5% 0.1W
R1430	0103847	CHIP RESISTOR 2.2KOHM+-5% 0.1W
R1431	0103839	CHIP RESISTOR 470 OHM+-5% 0.1W
R1432	0103879	CHIP RESISTOR 1MOHM+-5% 0.1W
R1446	0209925	CERAMIC DISC 5PF+-0.25% 50V
R2101	0700059	CARBON FILM 27KOHM+-5% 1/8W
R2102	0103867	CHIP RESISTOR 100KOHM+-5% 0.1W
R2103	0103863	CHIP RESISTOR 47KOHM+-5% 0.1W
R2104	0103835	CHIP RESISTOR 220 OHM+-5% 0.1W
R2105	0103863	CHIP RESISTOR 47KOHM+-5% 0.1W
R2106	0103837	CHIP RESISTOR 330 OHM+-5% 0.1W
R2107	0104273	CHIP RESISTOR 2.2KOHM+-5% 0.1W
R2108	0104125	CHIP RESISTOR 3.9KOHM+-5% 0.1W
R2109	0104273	CHIP RESISTOR 2.2KOHM+-5% 0.1W
R2110	0104125	CHIP RESISTOR 3.9KOHM+-5% 0.1W
R2111	0104263	CHIP RESISTOR 2.2KOHM+-5% 0.1W
R2112	0104263	CHIP RESISTOR 2.2KOHM+-5% 0.1W
R2113	0103837	CHIP RESISTOR 330 OHM+-5% 0.1W
R2114	0103835	CHIP RESISTOR 220 OHM+-5% 0.1W
R2115	0103855	CHIP RESISTOR 10KOHM+-5% 0.1W
R2116	0103855	CHIP RESISTOR 10KOHM+-5% 0.1W
R2117	0103859	CHIP RESISTOR 22KOHM+-5% 0.1W
R2507	0103849	CHIP RESISTOR 3.3KOHM+-5% 0.1W
R2508	0103863	CHIP RESISTOR 47KOHM+-5% 0.1W
R2509	0103849	CHIP RESISTOR 3.3KOHM+-5% 0.1W
R2510	0103863	CHIP RESISTOR 47KOHM+-5% 0.1W
R2511	0103849	CHIP RESISTOR 3.3KOHM+-5% 0.1W
R2512	0103849	CHIP RESISTOR 3.3KOHM+-5% 0.1W
R2514	0101836	CARBON FILM 1.8KOHM+-5% 1/4W
R2518	0103867	CHIP RESISTOR 100KOHM+-5% 0.1W
R2529	0103833	CHIP RESISTOR 150 OHM+-5% 0.1W
R2530	0103833	CHIP RESISTOR 150 OHM+-5% 0.1W
R2531	0103855	CHIP RESISTOR 10KOHM+-5% 0.1W
R2532	0103855	CHIP RESISTOR 10KOHM+-5% 0.1W
R2534	0103850	CHIP RESISTOR 3.9KOHM+-5% 0.1W
R2535	0103843	CHIP RESISTOR 1KOHM+-5% 0.1W
R2542	0103831	CHIP RESISTOR 100 OHM+-5% 0.1W
R2543	0103855	CHIP RESISTOR 10KOHM+-5% 0.1W

SEMI-CONDUCTORS

SYMBOL NO	P-NO	DESCRIPTION
D0206	5339071	DIODE 1SS119
D0207	5339071	DIODE 1SS119
D0401	5339071	DIODE 1SS119
⚠ D0851	5336552	DIODE S1WBA60
D0852	CH10191M	DIODE EG01C-T
D0853	CH10481M	DIODE AG01Z
D0854	CH10481M	DIODE AG01Z
D0855	CH10481M	DIODE AG01Z
D0871	5339592	DIODE D1NL40
D0872	CH10462S	DIODE S3L20U
D0873	CH10641S	DIODE D3S6M
D0876	CH11521M	DIODE STR14
D0877	CH11521M	DIODE STR14
D0878	5339071	DIODE 1SS119
D0896	CH10871M	DIODE 1N4001
D0897	CH10871M	DIODE 1N4001
D0898	CH10871M	DIODE 1N4001
D0901	CH11521M	DIODE STR14
D0906	5339071	DIODE 1SS119
D0907	5339071	DIODE 1SS119
D0908	5339071	DIODE 1SS119
D0909	5339071	DIODE 1SS119
D0912	CH10871M	DIODE 1N4001

SYMBOL NO	P-NO	DESCRIPTION
D0913	CH10871M	DIODE 1N4001
D1103	5339071	DIODE 1SS119
D1403	5339071	DIODE 1SS119
D2501	5339071	DIODE 1SS119
D2502	5339071	DIODE 1SS119
D2503	5339071	DIODE 1SS119
D2505	5339071	DIODE 1SS119
LD2101	CH10542	DIODE GL451L1
IC0201	CK22053	IC JCP8016MSB(HEPM)
IC0501	CK14421	IC AN3964FB
IC0851	CP12461F	IC STR-F6653 (HEPM)
IC0871	CP11961R	IC HA17431PA
IC0901	CK23523	IC HD6433977SC65F(HEPM)
IC0902	CP10312R	IC PST9129
IC0903	CP11013	IC AT24C04-10PC (HEPM)
IC0904	CP10291	IC BA6209
IC0905	CP11361R	IC M5278L05
IC1102	CK20671R	IC AN3329S-E1
IC2101	CJ10391	SENSOR SG-HT10(T)
IC2102	CJ10401	SENSOR SG-HT11(S)
⚠ PC0851	CF10431G	PHOTO COUPLER PC123FY
⚠ PC0852	CF10431G	PHOTO COUPLER PC123FY
Q0202	CA11262R	TRANSISTOR DTC144EKA
Q0219	CA11262R	TRANSISTOR DTC144EKA
Q0222	CA11262R	TRANSISTOR DTC144EKA
Q0229	CA11262R	TRANSISTOR DTC144EKA
Q0232	CA11262R	TRANSISTOR DTC144EKA
Q0234	CA11252R	TRANSISTOR DTA144EKA
Q0403	CA10672R	TRANSISTOR 2SD601A
Q0405	CA10582R	TRANSISTOR 2SB709A
Q0406	5323172	TRANSISTOR 2SC1214CD
Q0411	CA10582R	TRANSISTOR 2SB709A
Q0412	CA10672R	TRANSISTOR 2SD601A
Q0413	CA10672R	TRANSISTOR 2SD601A
Q0853	1321341	TRANSISTOR 2SD1765
Q0859	CA10672R	TRANSISTOR 2SD601A
Q0871	CA11262R	TRANSISTOR DTC144EKA
Q0873	5327063	TRANSISTOR 2SC1740S
Q0874	5327262	TRANSISTOR 2SB1326
Q0875	CA10672R	TRANSISTOR 2SD601A
Q0876	5327262	TRANSISTOR 2SB1326
Q0877	CA10672R	TRANSISTOR 2SD601A
Q0878	5327262	TRANSISTOR 2SB1326
Q0879	5327021	TRANSISTOR 2SA844CD
Q0880	1321341	TRANSISTOR 2SD1765
Q0896	CF10451R	TRANSISTOR 2SC3246
Q0901	5327261	TRANSISTOR 2SB1326(Q)
Q0902	CA11262R	TRANSISTOR DTC144EKA
Q0909	CA11262R	TRANSISTOR DTC144EKA
Q0913	CA11262R	TRANSISTOR DTC144EKA
Q0914	CA11262R	TRANSISTOR DTC144EKA
Q1104	CA11262R	TRANSISTOR DTC144EKA
Q1404	CA10582R	TRANSISTOR 2SB709A
Q1407	CA10582R	TRANSISTOR 2SB709A
Q1408	CA10582R	TRANSISTOR 2SB709A
Q1409	CA11262R	TRANSISTOR DTC144EKA
Q1410	CA10582R	TRANSISTOR 2SB709A
Q2101	CF10372	TRANSISTOR PT493FL1
Q2102	CF10372	TRANSISTOR PT493FL1
Q2103	CA11262R	TRANSISTOR DTC144EKA
Q2104	CA11262R	TRANSISTOR DTC144EKA
Q2501	CA10672R	TRANSISTOR 2SD601A
Q2502	CA10672R	TRANSISTOR 2SD601A
Q2503	CA10672R	TRANSISTOR 2SD601A
Q2505	CA11262R	TRANSISTOR DTC144EKA

SYMBOL NO	P-NO	DESCRIPTION
Q2506	5327021	TRANSISTOR 2SA844CD
Q2508	CA10672R	TRANSISTOR 2SD601A
Q2511	CA11252R	TRANSISTOR DTA144EKA
⚠ QF0871	5721946	IC PROTECTOR,ICP-N15
⚠ QF0872	5721944	IC PROTECTOR,ICP-N25
⚠ QF0873	5721943	IC PROTECTOR,ICP-N10
ZD0871	5339468	DIODE HZS11B3
ZD0872	5339482	DIODE HZS15-2
ZD0896	5339464	DIODE HZS12A3
ZD0901	5339275	DIODE HZS7-B2
ZD0903	5339297	DIODE HZS5C3
ZD2501	5339288	DIODE HZS30-3

TRANSFORMER

T0401	BT10251	TRANSFORMER,POWER
⚠ T0851	BT10481	TRANSFORMER,POWER

COILS

L0201	5159142	CHOKE COIL 12UH
L0202	0770057	CHOKE COIL 100UH+-5%
L0205	0770057	CHOKE COIL 100UH+-5%
L0207	5159153	CHOKE COIL 82UH
L0208	0770057	CHOKE COIL 100UH+-5%
L0209	5159156	CHOKE COIL 150UH
L0210	5159146	CHOKE COIL 27UH
L0401	0770057	CHOKE COIL 100UH+-5%
L0403	0770057	CHOKE COIL 100UH+-5%
L0501	0770048	CHOKE COIL 22UH+-5%
⚠ L0851	BJ10251	FILTER,LC
⚠ L0852	BJ10251	FILTER,LC
L0871	BH00201R	COIL 10UH
L0872	BH00205R	COIL 22UH
L0901	0770057	CHOKE COIL 100UH+-5%
L1101	5121611	COIL 100UH
L1102	0770057	CHOKE COIL 100UH+-5%
L1105	5121296	COIL 220UH
L1402	5121288	COIL 15UH
L2501	0770053	CHOKE COIL 47UH+-5%
L2502	0770057	CHOKE COIL 100UH+-5%
L2504	0770052	CHOKE COIL 39UH+-5%
L2505	0770057	CHOKE COIL 100UH+-5%
L2507	0770053	CHOKE COIL 47UH+-5%

CRYSTALS

X0202	BP10541	CRYSTAL (HEPM)
X0901	BP10571	CRYSTAL
X0902	BP10251	CRYSTAL
X1401	BP10573	CRYSTAL (HEPM)

MISCELLANEOUS

BL0601	BZ10471R	CORE
BL0602	BZ10471R	CORE
BL0603	BZ10471R	CORE
BL0604	5272376	FILTER
BL0851	BZ10471R	CORE
BL0852	BZ10471R	CORE
BL0853	BZ10471R	CORE
BL0854	BZ10471R	CORE
BL0871	BZ10471R	CORE
BL0872	BZ10471R	CORE
BL0873	BZ10471R	CORE

SYMBOL NO	P-NO	DESCRIPTION
BL0874	5274522	CORE
⚠ F0851	5721061	FUSE 1.6A
FE2501	HC10351	TUNER IF UNIT (HEPM) [(UKN),(UKN)C]
FE2501	HC10352	TUNER IF UNIT (HEPM) [NA,VPS]
⚠ FH0851	5722413	HOLDER,FUSE (HEPM)
⚠ FH0852	5722413	HOLDER,FUSE (HEPM)
PG0401	5819706	CONNECTOR(HEPM)
PG0402	ED11043	CONNECTOR(HEPM)
PG0601	ED10882	PLUG
PG0602	ED11044	PLUG
PG0702	ED10622	PLUG
PG0703	ED10622	PLUG
PG0851	ED10111	CONNECTOR
PG0901	ED10881	PLUG
PG1101	ED11542	CONNECTOR(HEPM)
PG2501	5668185	MINI PLUG
PG2502	5668186	MINI PLUG
PG2503	ED10622	PLUG
PG2505	ED10622	PLUG
PG2508	5668185	MINI PLUG
S0704	FE10141R	SWITCH
S0706	FE10141R	SWITCH
S0707	FE10141R	SWITCH
S0708	5636101	SWITCH
S0709	FE10141R	SWITCH
S0710	FE10141R	SWITCH
S0711	FE10141R	SWITCH
S0712	FE10141R	SWITCH
S2101	FD10211	SWITCH,MODE
S2102	5635631	SWITCH
S2103	5635631	SWITCH

RJK BOARD

CAPACITORS

C4501	0800109	ELECTROLYTIC 1.0UF 50V
C4502	0800109	ELECTROLYTIC 1.0UF 50V
C4503	0890044	CERAMIC DISC 0.022UF+80-20% 25V
C4504	0800153	ELECTROLYTIC 470UF 6.3V
C4505	0800109	ELECTROLYTIC 1.0UF 50V
C4506	0800122	ELECTROLYTIC 10UF 16V
C4507	0800122	ELECTROLYTIC 10UF 16V
C4508	0800122	ELECTROLYTIC 10UF 16V
C4509	0800122	ELECTROLYTIC 10UF 16V
C4510	0800122	ELECTROLYTIC 10UF 16V
C4511	0800122	ELECTROLYTIC 10UF 16V
C4512	0800122	ELECTROLYTIC 10UF 16V
C4513	0800122	ELECTROLYTIC 10UF 16V
C4514	0800145	ELECTROLYTIC 100UF 16V
C4515	0800122	ELECTROLYTIC 10UF 16V
C4516	0800122	ELECTROLYTIC 10UF 16V
C4517	0800122	ELECTROLYTIC 10UF 16V
C4518	0800122	ELECTROLYTIC 10UF 16V
C4519	0800122	ELECTROLYTIC 10UF 16V
C4520	0800153	ELECTROLYTIC 470UF 6.3V
C4522L	0890035	CERAMIC DISC 1000PF+-10% 50V
C4522R	0890035	CERAMIC DISC 1000PF+-10% 50V
C4524L	0890032	CERAMIC DISC 560PF+-10% 50V
C4524R	0890032	CERAMIC DISC 560PF+-10% 50V
C4526L	0890035	CERAMIC DISC 1000PF+-10% 50V
C4526R	0890035	CERAMIC DISC 1000PF+-10% 50V
C4528L	0890032	CERAMIC DISC 560PF+-10% 50V
C4528R	0890032	CERAMIC DISC 560PF+-10% 50V
C4530	0890008	CERAMIC DISC 10PF+-5% 50V
C4531	0890018	CERAMIC DISC 56PF+-50% 50V
C4532	0890018	CERAMIC DISC 56PF+-50% 50V
C4533	0800153	ELECTROLYTIC 470UF 6.3V
C4534	0800122	ELECTROLYTIC 10UF 16V
C4536	0800109	ELECTROLYTIC 1UF 50V
C4537	0800141	ELECTROLYTIC 47UF 16V
C4538	0890044	CERAMIC DISC 0.022UF+80-20% 25V
C4565	0800122	ELECTROLYTIC 10UF 16V
C4571L	AN00622R	CAPACITOR 0.0068UF+-10% 50V
C4571R	AN00622R	CAPACITOR 0.0068UF+-10% 50V
C4572L	0800122	ELECTROLYTIC 10UF 16V
C4572R	0800122	ELECTROLYTIC 10UF 16V
C4581	0890018	CERAMIC DISC 56PF+-50% 50V
C4582	0880016	POLYESTER FILM 0.1UF+-10% 50V
C4583	0800122	ELECTROLYTIC 10UF 16V
C4584	AN00615R	CAPACITOR 0.0022UF+-10% 50V
C4585	0880187	CAPACITOR 0.033UF+-5% 50V

RESISTORS

R4502	0700037	CARBON FILM 560 OHM+-5% 1/8W
R4503	1109023	METAL FILM 75 OHM+-50% 1/8W
R4504	1109023	METAL FILM 75 OHM+-50% 1/8W
R4505	0700049	CARBON FILM 4.7KOHM+-5% 1/8W
R4506	0700045	CARBON FILM 2.2KOHM+-5% 1/8W
R4507	1109023	METAL FILM 75 OHM+-50% 1/8W
R4508	1109023	METAL FILM 75 OHM+-50% 1/8W
R4510	0700063	CARBON FILM 47KOHM+-5% 1/8W
R4511	0700061	CARBON FILM 33KOHM+-5% 1/8W
R4512L	0700036	CARBON FILM 470 OHM+-5% 1/8W
R4512R	0700036	CARBON FILM 470 OHM+-5% 1/8W
R4514L	0700036	CARBON FILM 470 OHM+-5% 1/8W
R4514R	0700036	CARBON FILM 470 OHM+-5% 1/8W
R4516	0700054	CARBON FILM 10KOHM+-5% 1/8W
R4517	0700054	CARBON FILM 10KOHM+-5% 1/8W
R4518	0700042	CARBON FILM 1.2KOHM+-5% 1/8W
R4519	0700027	CARBON FILM 100 OHM+-5% 1/8W
R4571L	0700032	CARBON FILM 220 OHM+-5% 1/8W
R4571R	0700032	CARBON FILM 220 OHM+-5% 1/8W
R4572L	0700063	CARBON FILM 47KOHM+-5% 1/8W
R4572R	0700063	CARBON FILM 47KOHM+-5% 1/8W
R4573L	0700032	CARBON FILM 220 OHM+-5% 1/8W
R4573R	0700032	CARBON FILM 220 OHM+-5% 1/8W
R4584	0700081	CARBON FILM 1.0MOHM+-5% 1/8W
R4585	0101970	CARBON FILM 1.2MOHM+-5% 1/8W
R4587	0700067	CARBON FILM 100KOHM+-5% 1/8W
R4588	0101970	CARBON FILM 1.2MOHM+-5% 1/8W
R4589	0700052	CARBON FILM 6.8KOHM+-5% 1/8W
R4590	0700052	CARBON FILM 6.8KOHM+-5% 1/8W

SEMI-CONDUCTORS

D4501	5339071	DIODE 1SS119
IC4501	CK22741R	IC LA7147M (HEPM)
IC4581	CP10642	IC SDA5650 (HEPM)
Q4501	5327031	TRANSISTOR 2SA673(C)
Q4502	CF10852R	TRANSISTOR DTC144ESA
Q4503	5327141	TRANSISTOR 2SD468C
⚠ QF4501	5721941	IC PROTECTOR,ICP-N5
ZD4501	5339277	DIODE HZS6A2
ZD4502	5339293	DIODE HZS12B2

SYMBOL NO	P-NO	DESCRIPTION
		COILS
L4501	0770057	CHOKE COIL 100UH+-5%
L4502	0770057	CHOKE COIL 100UH+-5%
L4581	0770057	CHOKE COIL 100UH+-5%
		MISCELLANEOUS
BL4501L	BZ10471R	CORE
BL4501R	BZ10471R	CORE
BL4502L	BZ10471R	CORE
BL4502R	BZ10471R	CORE
BL4503L	BZ10471R	CORE
BL4503R	BZ10471R	CORE
BL4504L	BZ10471R	CORE
BL4504R	BZ10471R	CORE
BL4571L	BZ10471R	CORE
BL4571R	BZ10471R	CORE
J4501	EQ10261	JACK
J4502	EQ10262	JACK
J4571	ES10391	JACK (HEPM)
		N&A BOARD [FOR (UKN),(UKN)C,(NA)]
		CAPACITORS
C1801	0893079	CERAMIC DISC 0.01UF+80-20% 50V
C1803	0893079	CERAMIC DISC 0.01UF+80-20% 50V
C1812	0893059	CERAMIC DISC 0.47UF+80-20% 16V
C1814	0893027	CERAMIC CHIP 0.1UF+-10% 25V
C1815	0209896	CERAMIC CHIP 47PF+-5% 50V
C1816	0800279	CAPACITOR 1.0UF+-20% 50V
C1817	0893079	CERAMIC DISC 0.01UF+80-20% 50V
C1819	0893079	CERAMIC DISC 0.01UF+80-20% 50V
C1821	0800291	ELECTROLYTIC 10UF 16V
C1822	0800316	ELECTROLYTIC 47UF 10V
C1825	0800316	ELECTROLYTIC 47UF 10V
C1826	0893004	CERAMIC CHIP 0.047UF+-10% 16V
C1827	0800316	ELECTROLYTIC 47UF 10V
C1828	0893004	CERAMIC CHIP 0.047UF+-10% 16V
C1831	0209923	CERAMIC CHIP 3PF+-0.25PF 50V
C1851L	0800291	ELECTROLYTIC 10UF 16V
C1851R	0800291	ELECTROLYTIC 10UF 16V
C1852L	0209853	CERAMIC DISC 68PF+-5% 50V
C1852R	0209853	CERAMIC DISC 68PF+-5% 50V
C1853L	0800291	ELECTROLYTIC 10UF 16V
C1853R	0800291	ELECTROLYTIC 10UF 16V
C1854L	0800291	ELECTROLYTIC 10UF 16V
C1854R	0800291	ELECTROLYTIC 10UF 16V
C1855L	0893037	CERAMIC CHIP 3300PF+-10% 50V
C1855R	0893037	CERAMIC CHIP 3300PF+-10% 50V
C1861	0893004	CERAMIC CHIP 0.047UF+-10% 16V
C1862	0893008	CERAMIC CHIP 0.1UF+-10% 16V
		RESISTORS
R1805	0103854	CHIP RESISTOR 8.2KOHM+-5% 0.1W
R1806	0103831	CHIP RESISTOR 100 OHM+-5% 0.1W
R1807	0103831	CHIP RESISTOR 100 OHM+-5% 0.1W
R1813	0103860	CHIP RESISTOR 27KOHM+-5% 0.1W
R1816	0103867	CHIP RESISTOR 100KOHM+-5% 0.1W
R1817	0700053	CARBON FILM 8.2KOHM+-5% 1/8W
R1851L	0103855	CHIP RESISTOR 10KOHM+-5% 0.1W
R1851R	0103855	CHIP RESISTOR 10KOHM+-5% 0.1W

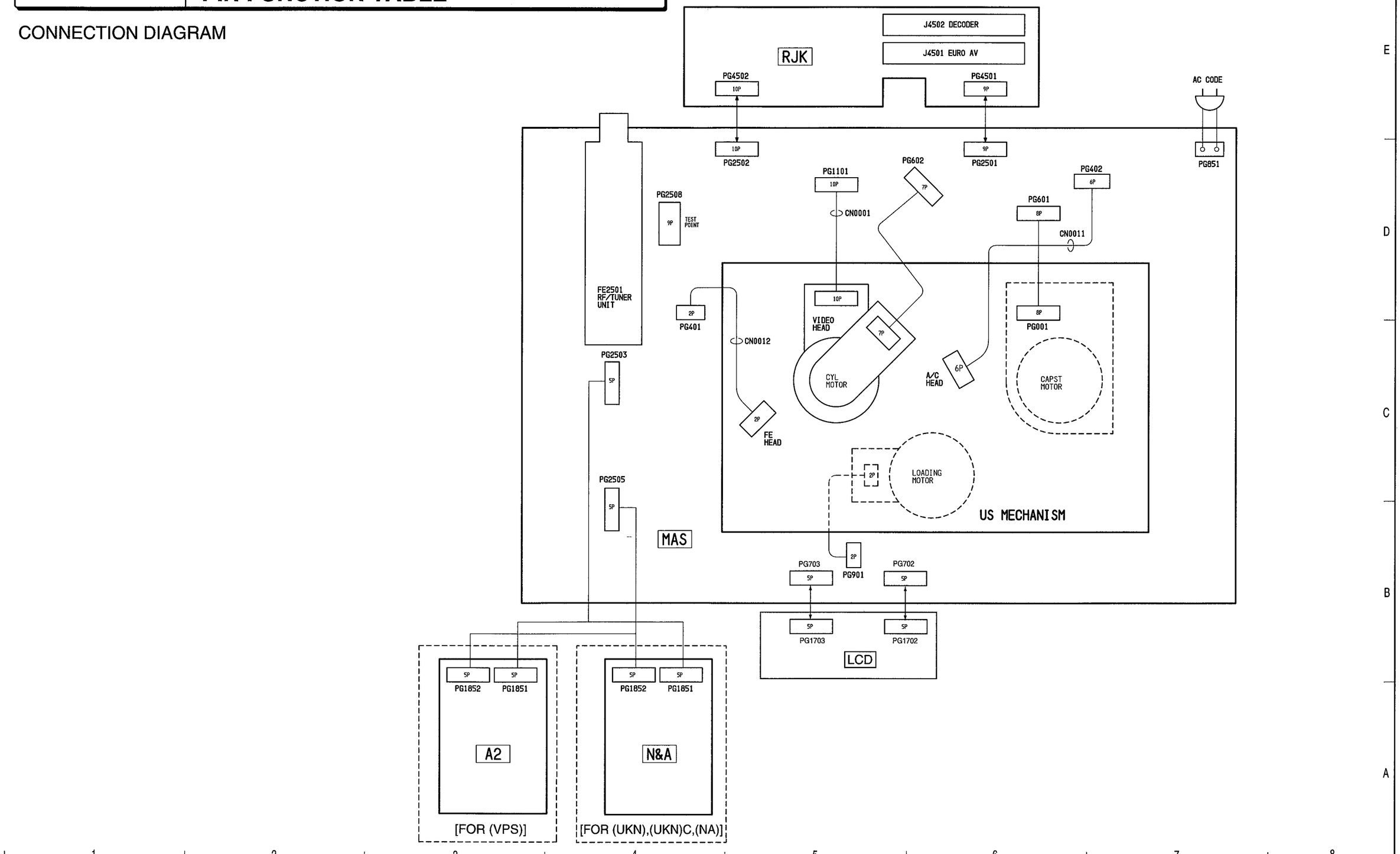
SYMBOL NO	P-NO	DESCRIPTION
R1852L	0103879	CHIP RESISTOR 1MOHM+-5% 0.1W
R1852R	0103879	CHIP RESISTOR 1MOHM+-5% 0.1W
R1853L	0103867	CHIP RESISTOR 100KOHM+-5% 0.1W
R1853R	0103867	CHIP RESISTOR 100KOHM+-5% 0.1W
R1854L	0103868	CHIP RESISTOR 120KOHM+-5% 0.1W
R1854R	0103868	CHIP RESISTOR 120KOHM+-5% 0.1W
R1855L	0103862	CHIP RESISTOR 39KOHM+-5% 0.1W
R1855R	0103862	CHIP RESISTOR 39KOHM+-5% 0.1W
R1856L	0103861	CHIP RESISTOR 33KOHM+-5% 0.1W
R1856R	0103861	CHIP RESISTOR 33KOHM+-5% 0.1W
R1857L	0103832	CHIP RESISTOR 120 OHM+-5% 0.1W
R1857R	0103832	CHIP RESISTOR 120 OHM+-5% 0.1W
		SEMI-CONDUCTORS
IC1801	CK21163	IC TDA9874AH (HEPM)
IC1802	5352714	IC NJM4558M
		COILS
L1802	BH10339R	CHOKE COIL 22UH+-5%
L1803	0770057	CHOKE COIL 100UH+-5%
L1851L	5159113	COIL,CHOKE 8.2MH
L1851R	5159113	COIL,CHOKE 8.2MH
		CRYSTAL
X1801	BP10821	CRYSTAL
		MISCELLANEOUS
BL1801	BM00154R	COIL
BL1802	BM00154R	COIL
PG1851	ED10602	CONNECTOR(HEPM)
PG1852	ED10602	CONNECTOR(HEPM)
		A2 BOARD [FOR (VPS)]
		CAPACITORS
C1857	0800185	ELECTROLYTIC 47UF 6.3V
C1858	0890043	CERAMIC DISC 0.01UF+-20% 16V
C1860	0800176	ELECTROLYTIC 2.2UF 50V
C1861	0800176	ELECTROLYTIC 2.2UF 50V
C1862	0800178	ELECTROLYTIC 4.7UF 35V
C1863	0800178	ELECTROLYTIC 4.7UF 35V
C1864	0800015	ELECTROLYTIC 10UF 16V
C1865	0800179	ELECTROLYTIC 10UF 16V
C1871	0800176	ELECTROLYTIC 2.2UF 50V
C1872	0800176	ELECTROLYTIC 2.2UF 50V
C1873	AJ10176R	CERAMIC CAPACITOR 5.0PF+-0.25% 50V
C1874	0890043	CERAMIC DISC 0.01UF+-20% 16V
C1876	0890043	CERAMIC DISC 0.01UF+-20% 16V
C1879	0800176	ELECTROLYTIC 2.2UF 50V
C1881	0890045	CERAMIC DISC 0.047UF+80-20% 50V
C1882	0890046	CERAMIC DISC 0.1UF+80-20% 50V
C1890	0890043	CERAMIC DISC 0.01UF+-20% 16V
C1891	0890043	CERAMIC DISC 0.01UF+-20% 16V
C1895	0890025	CERAMIC DISC 180PF+-10% 50V
C1896	0800187	ELECTROLYTIC 100UF 6.3V
C1897	0890036	CERAMIC DISC 1500PF+-20% 16V
C1898	0800179	ELECTROLYTIC 10UF 16V
C1899	0890046	CERAMIC DISC 0.1UF+80-20% 50V

SYMBOL NO	P-NO	DESCRIPTION
		RESISTORS
R1864	0700034	CARBON FILM 330 OHM+-5% 1/8W
R1865	0700034	CARBON FILM 330 OHM+-5% 1/8W
R1870	0700038	CARBON FILM 680 OHM+-5% 1/8W
R1871	0700037	CARBON FILM 560 OHM+-5% 1/8W
R1872	0700031	CARBON FILM 180 OHM+-5% 1/8W
R1873	0700049	CARBON FILM 4.7KOHM+-5% 1/8W
R1874	0700037	CARBON FILM 560 OHM+-5% 1/8W
R1875	0700028	CARBON FILM 120 OHM+-5% 1/8W
R1876	0700028	CARBON FILM 120 OHM+-5% 1/8W
R1877	0700049	CARBON FILM 4.7KOHM+-5% 1/8W
R1878	0700059	CARBON FILM 27KOHM+-5% 1/8W
R1899	0700059	CARBON FILM 27KOHM+-5% 1/8W
		SEMI-CONDUCTORS
IC1871	CK14551	IC TDA9840T
IC1872	1346191	IC TDA9821
		COILS
L1871	0770057	CHOKE COIL 100UH+-5%
L1872	5159111	CHOKE COIL 5600UH
		CRYSTAL
X1871	BP10571	CRYSTAL
		MISCELLANEOUS
CF1871	5160561	FILTER
CF1872	5160562	FILTER
PG1851	ED10602	CONNECTOR(HEPM)
PG1852	ED10602	CONNECTOR(HEPM)
		LCD BOARD
		CAPACITORS
C1701	0800185	ELECTROLYTIC 47UF 6.3V
C1702	0890103	CERAMIC DISC 47000PF+80-20% 12V
C1703	0890103	CERAMIC DISC 47000PF+80-20% 12V
C1704	0890103	CERAMIC DISC 47000PF+80-20% 12V
C1705	0890035	CERAMIC DISC 1000PF+-10% 50V
C1706	0800185	ELECTROLYTIC 47UF 6.3V
		RESISTORS
R1701	0700054	CARBON FILM 10KOHM+-5% 1/8W
R1702	0700063	CARBON FILM 47KOHM+-5% 1/8W
R1703	0700032	CARBON FILM 220 OHM+-5% 1/8W
R1704	0700032	CARBON FILM 220 OHM+-5% 1/8W
R1709	0700038	CARBON FILM 680 OHM+-5% 1/8W
R1710	0700038	CARBON FILM 680 OHM+-5% 1/8W
R1711	0700049	CARBON FILM 4.7KOHM+-5% 1/8W
R1712	0700049	CARBON FILM 4.7KOHM+-5% 1/8W
R1713	0700049	CARBON FILM 4.7KOHM+-5% 1/8W
R1714	0700033	CARBON FILM 270 OHM+-5% 1/8W

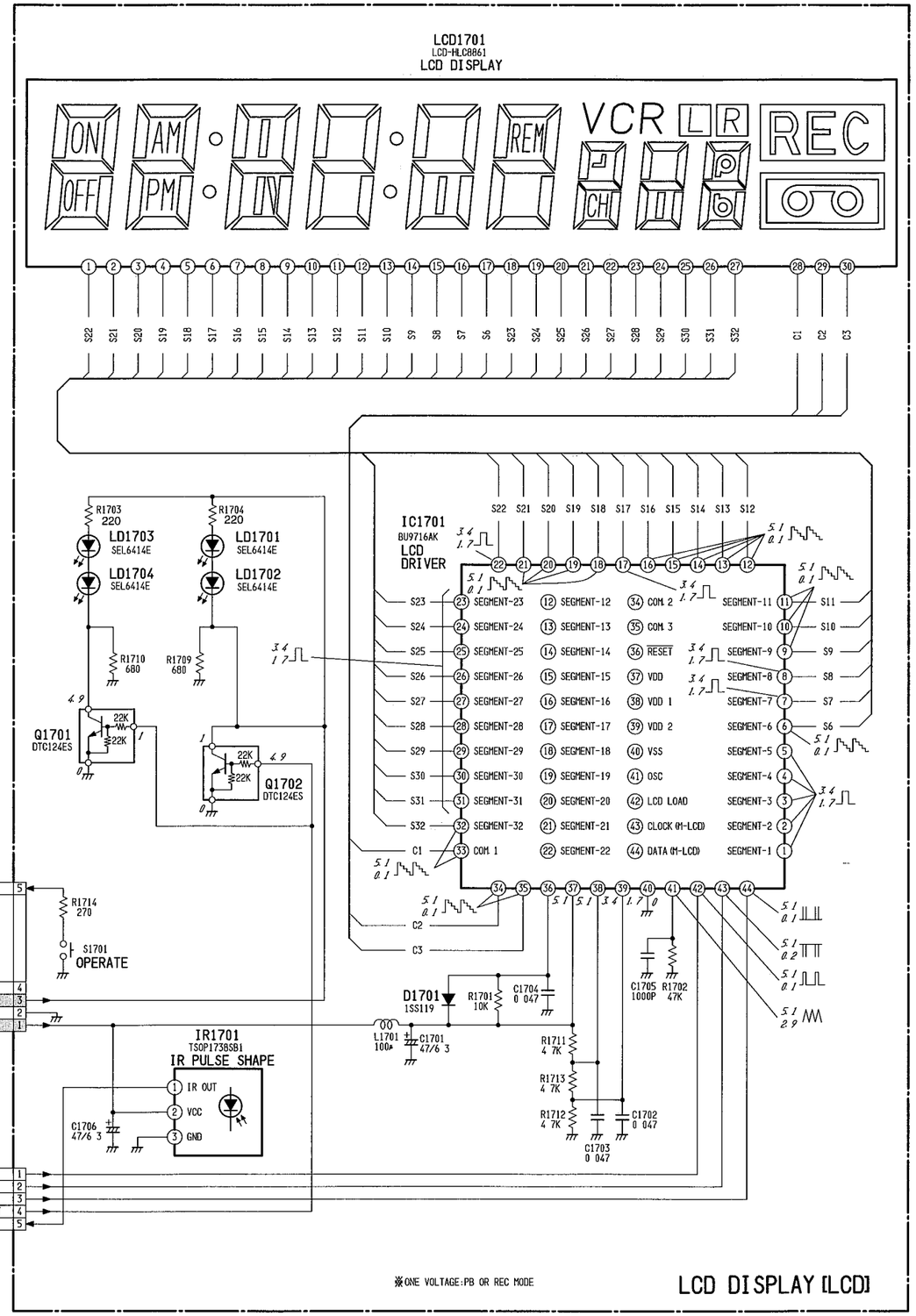
SYMBOL NO	P-NO	DESCRIPTION
		SEMI-CONDUCTORS
D1701	5339071	DIODE 1SS119
LD1701	CH10783R	DIODE SLP3117E-51HS (HEPM)
LD1702	CH10783R	DIODE SLP3117E-51HS (HEPM)
LD1703	CH10783R	DIODE SLP3117E-51HS (HEPM)
LD1704	CH10783R	DIODE SLP3117E-51HS (HEPM)
IC1701	CZ10182	IC BU9716AK (HEPM)
Q1701	CF10851R	TRANSISTOR DTC124ESA
Q1702	CF10851R	TRANSISTOR DTC124ESA
		MISCELLANEOUS
IR1701	CJ10411	MODULE TSOP1738SB1
LCD1701	DB10341	FLOURESENT DISPLAY
PG1702	ED10602	CONNECTOR(HEPM)
PG1703	ED10602	CONNECTOR(HEPM)
S1701	5634884	SWITCH

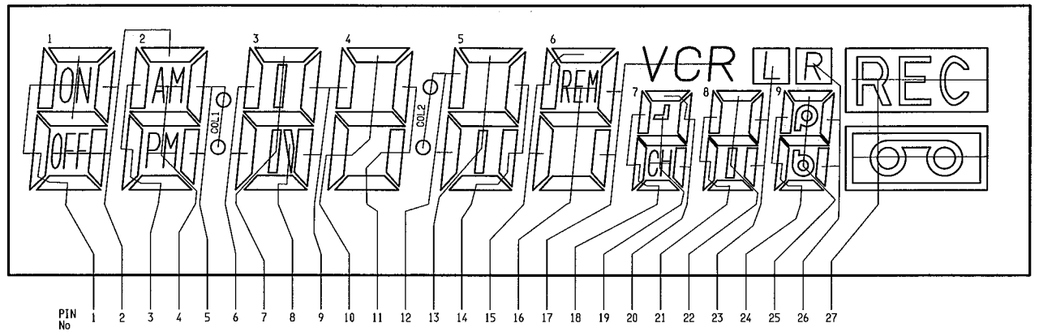
CHAPTER 6 SCHEMATIC, CIRCUIT BOARD AND BLOCK DIAGRAMS/MICROPROCESSOR PIN FUNCTION TABLE

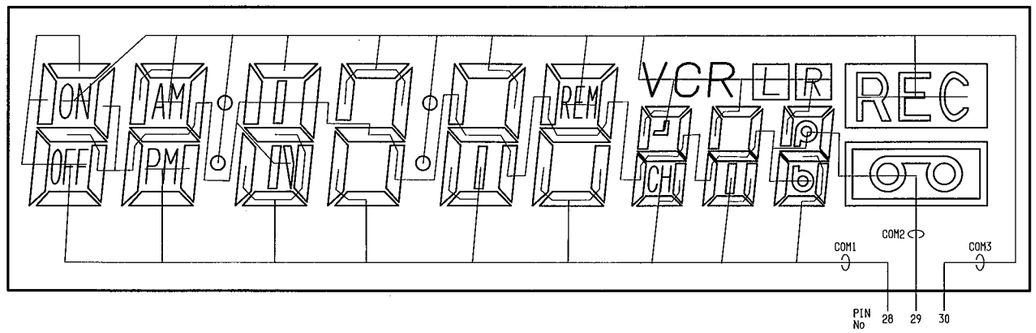
CONNECTION DIAGRAM



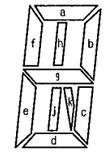
LCD DISPLAY [LCD], LCD GRID TABLE SCHEMATIC DIAGRAM



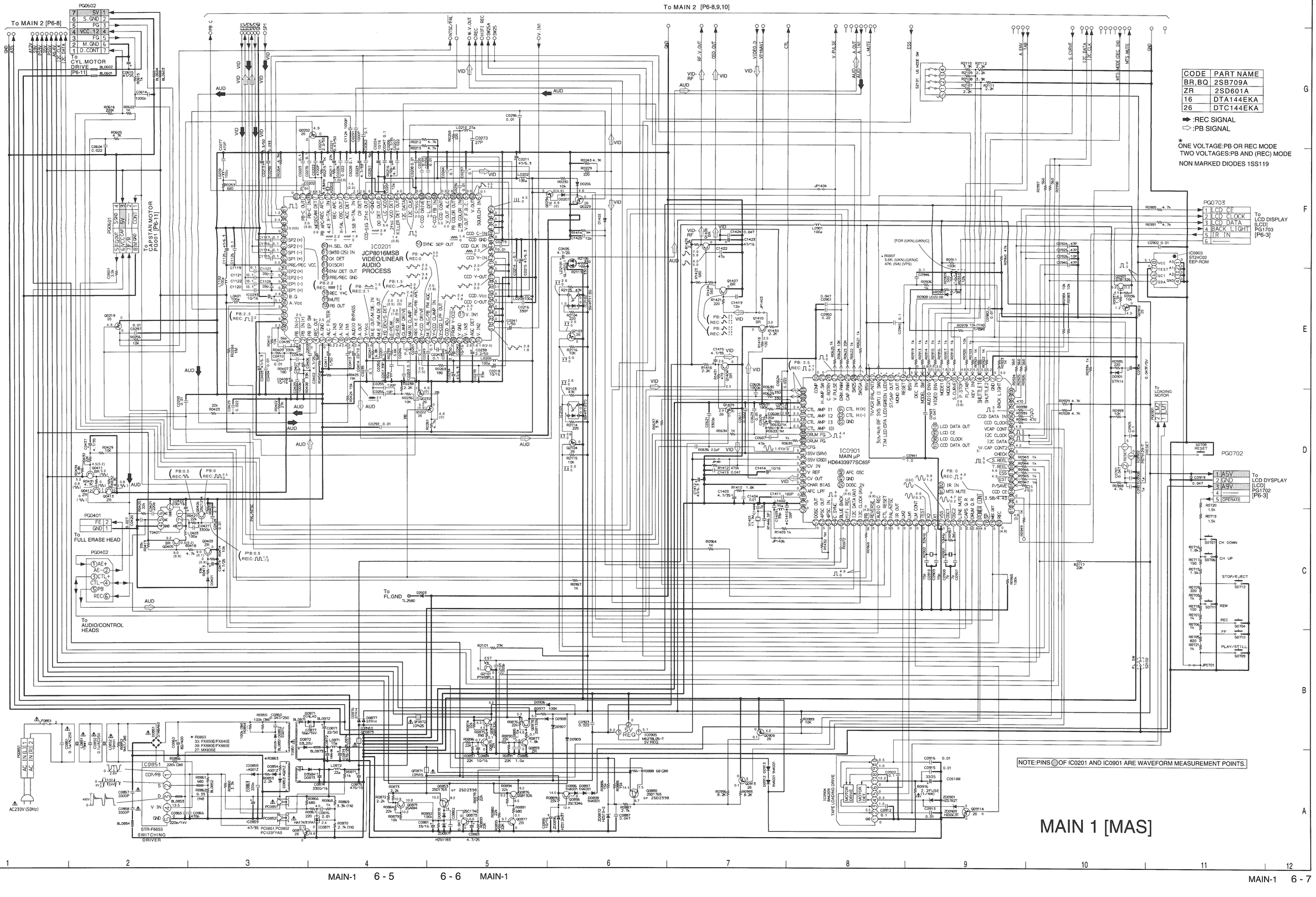




PIN No	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
COM1	ladef	OFF	2d	PM	2c	3e	3g	3d	3c	4e	4d	5e	5j	5d	6e	6d	6c	7d	CH	7c	8d	8j	8c	9d	9g	9c	—	COM	—	—
COM2	1g	1bc	2e	2g	2b	3f	3hj	3k	3b	4g	4c	5f	5g	5c	6f	6g	6b	7e	7g	7b	8e	8g	8b	9e	9b	9b	—	—	COM	—
COM3	ON	2a	2f	AM	COL1	—	3a	—	4f	4a	4b	COL2	5a	5b	6a	REM	VCR	7f	L	7a	8f	8a	L	9f	9a	R	REC	—	—	COM



MAIN-1 [MAS] SCHEMATIC DIAGRAM



MAIN-2 [MAS] SCHEMATIC DIAGRAM

CODE	PART NAME
BR,BQ	2SB709A
ZR	2SD601A
16	DTA144EKA
26	DTC144EKA

➡ :REC SIGNAL
⇨ :PB SIGNAL

* ONE VOLTAGE:PB OR REC MODE
TWO VOLTAGES:PB AND (REC) MODE
NON MARKED DIODES 1SS119

[FOR (VPS)]
To A2 [A2] PG1851 [P6-14]
To A2 [A2] PG1852 [P6-14]
[FOR (UKN),(UKN)C,(NA)]
To NICAM (N&A) PG1851 [P6-13]
To NICAM (N&A) PG1852 [P6-13]

PG2502
DEC IN 10
L1-A (L) IN 9
TUNA (L) IN 8
DECA (L) IN 7
AUD (L) OUT 6
GND 5
AUD (R) OUT 4
L1-A (R) IN 3
TUNA (R) IN 2
DECA (R) IN 1
To REAR JACK [RJK] PG4502 [P6-16]

PG2501
I2C DATA 9
I2C CLOCK 8
A5.4V 7
TUN VIDEO 6
GND (S) 5
OSD VIDEO 4
GND (S) 3
VIDEO IN 2
A12V 1
To REAR JACK [RJK] PG4501 [P6-15]

PG2508
VIDEO IN 9
SW25 8
V.OUT 7
GND 6
A (L) OUT 5
A (R) OUT 4
3
CTL 2
PB.C 1
TEST POINT

PG1101 To VIDEO/AUDIO HEADS

IC1102 AN3329S AUDIO HEAD AMP

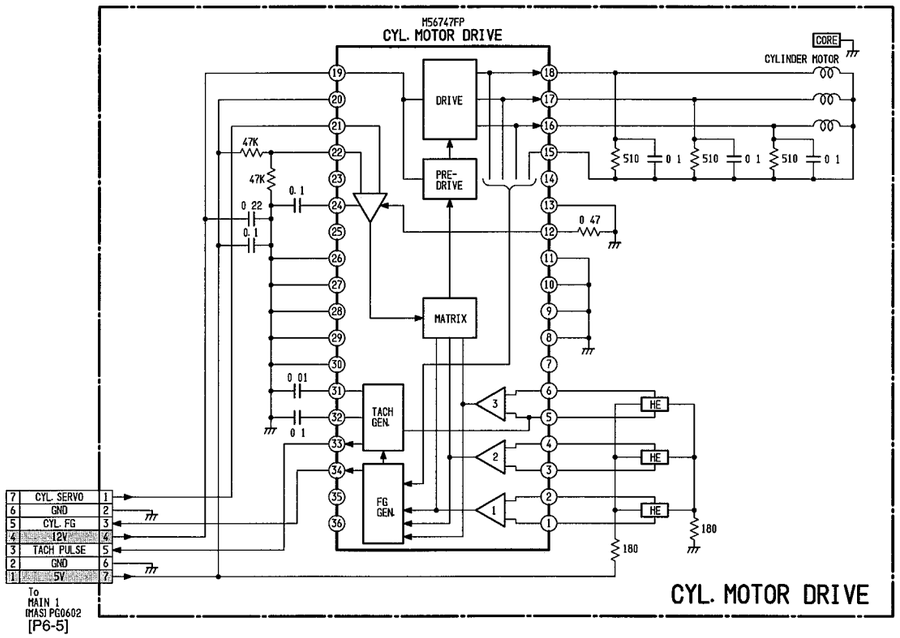
IC0501 AN3964FB FM AUDIO PROCESS

HIFI AUDIO

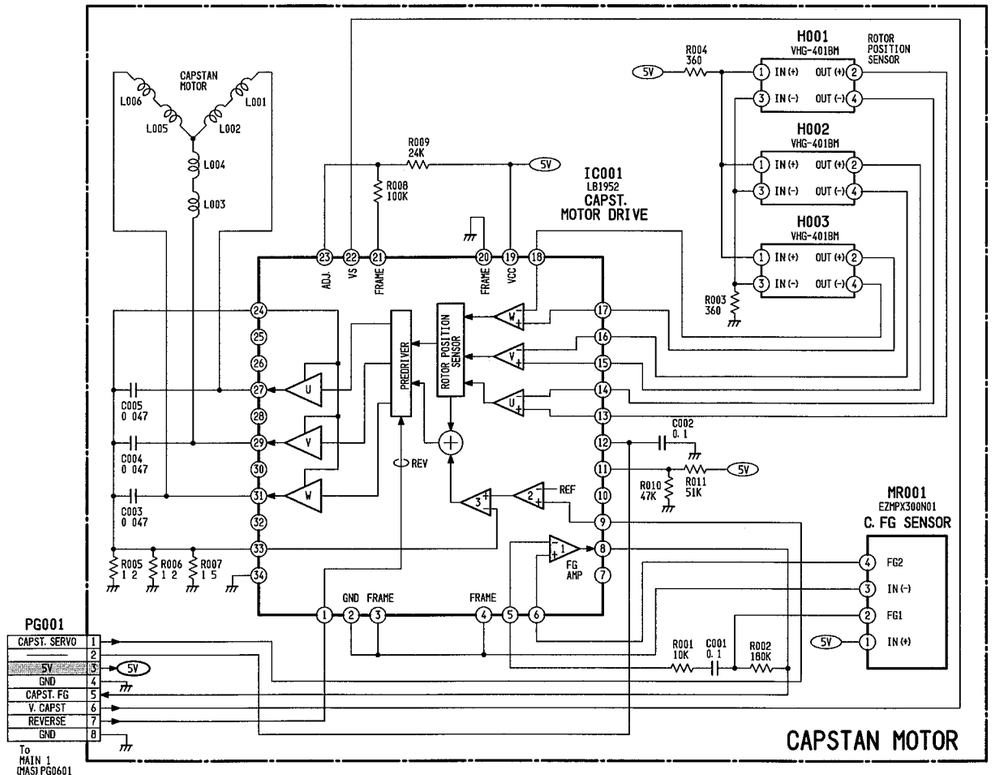
To MAIN 1 [P6-5,6,7]

MAIN 2 [MAS]

CYLINDER MOTOR SCHEMATIC DIAGRAM

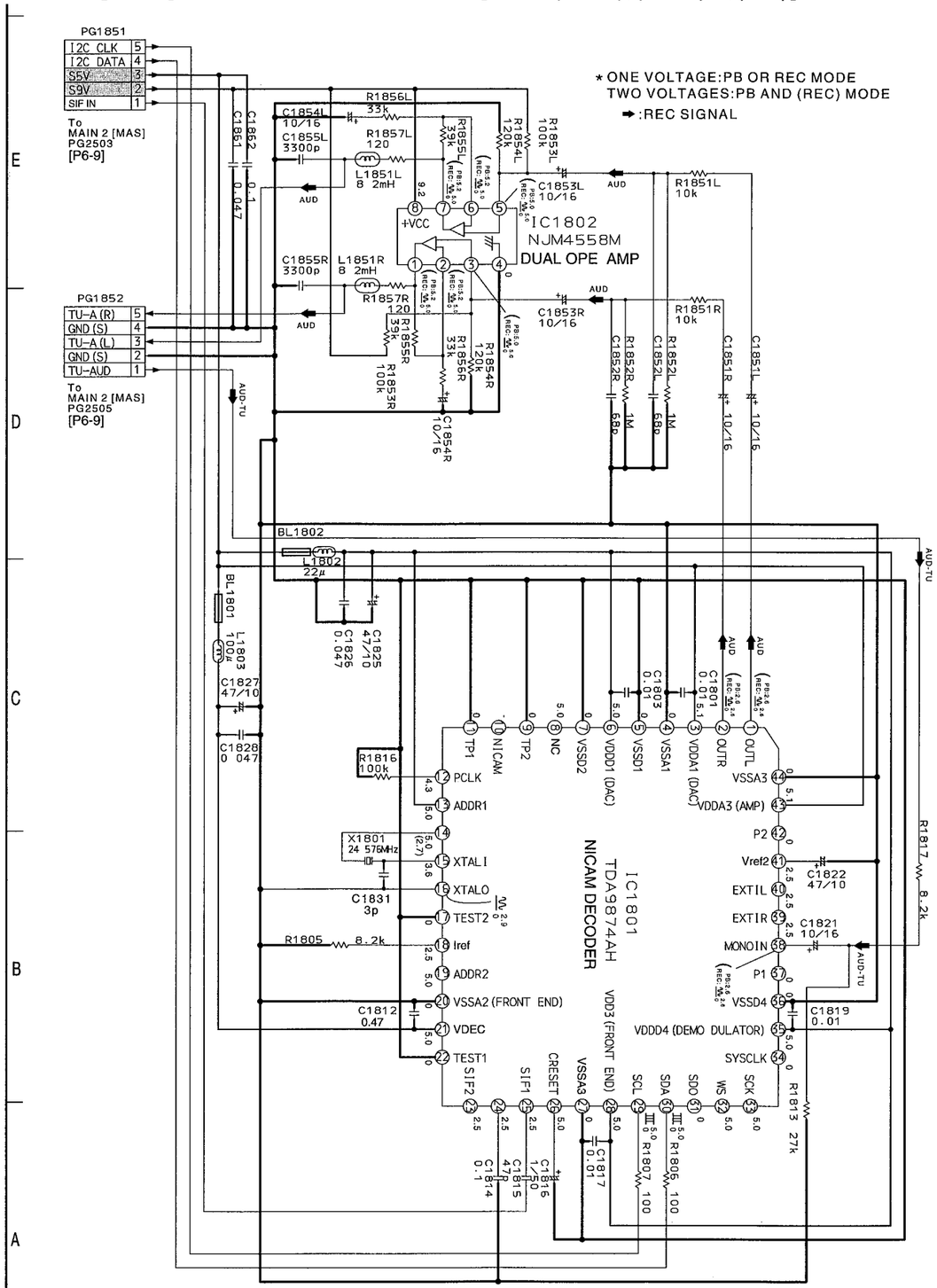


CAPSTAN MOTOR SCHEMATIC DIAGRAM

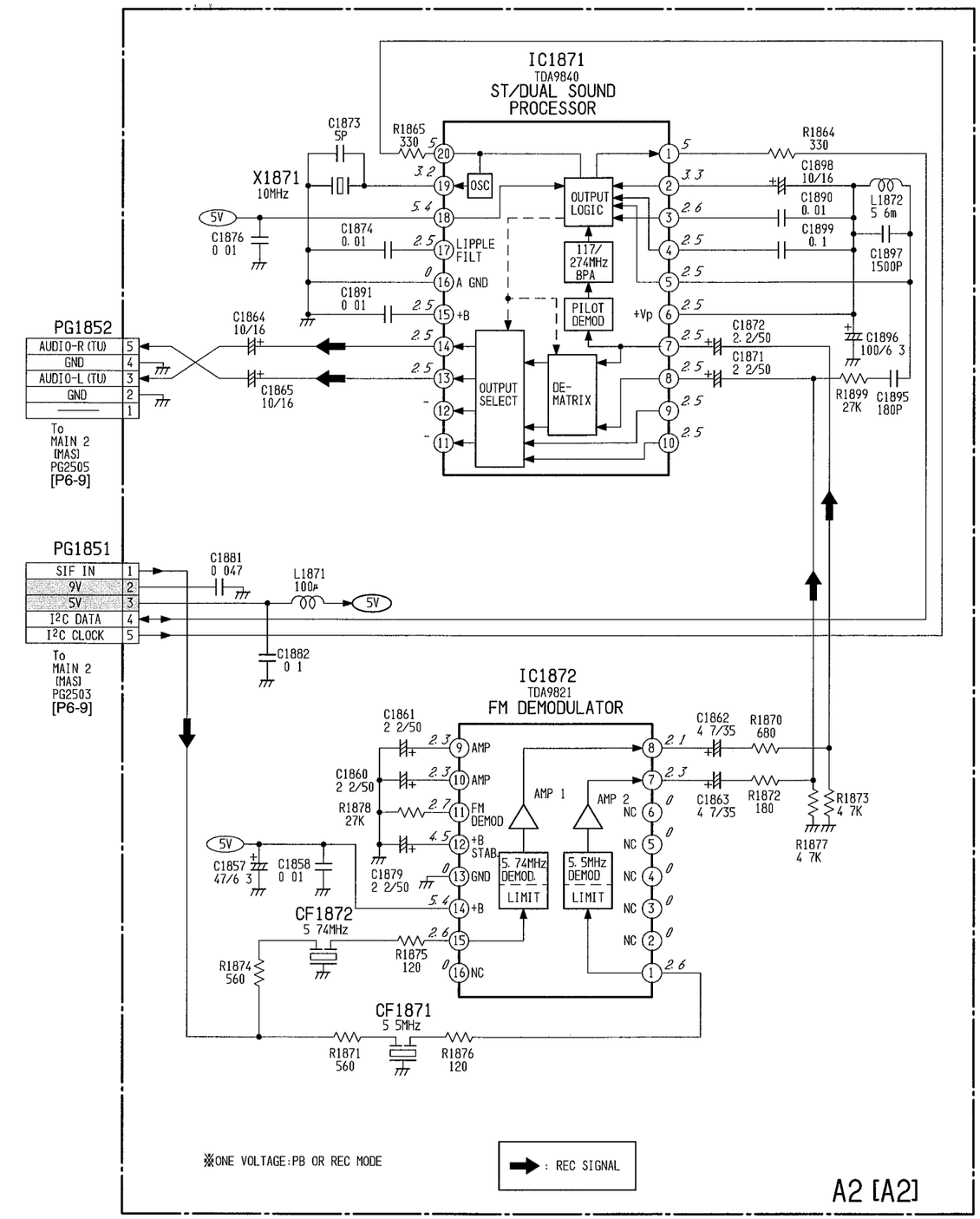


IC BLOCK DIAGRAM

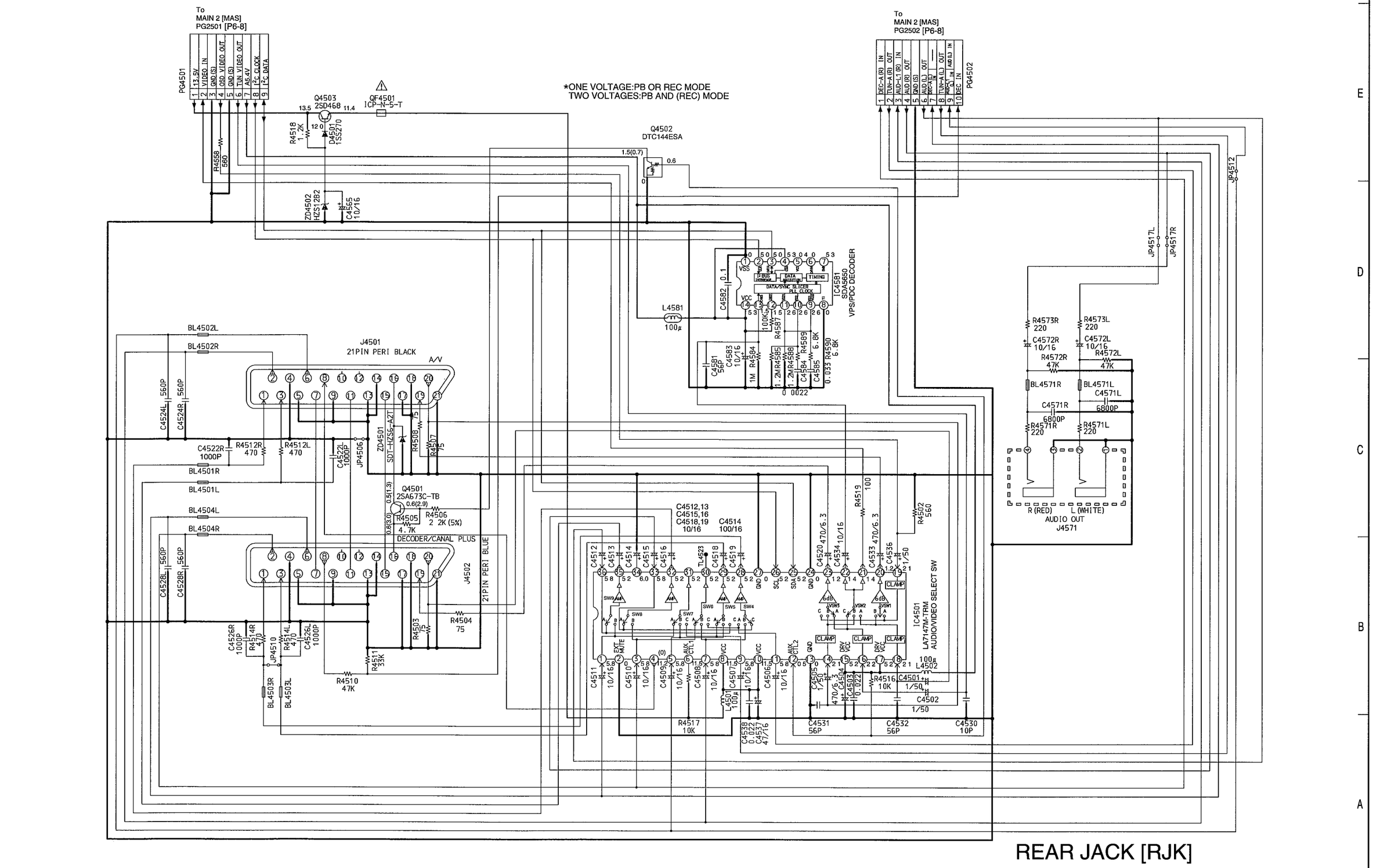
NICAM [N&M] SCHEMATIC DIAGRAM [FOR (UKN),(UKN)C,(NA)]



A2 [A2] SCHEMATIC DIAGRAM [FOR (VPS)]

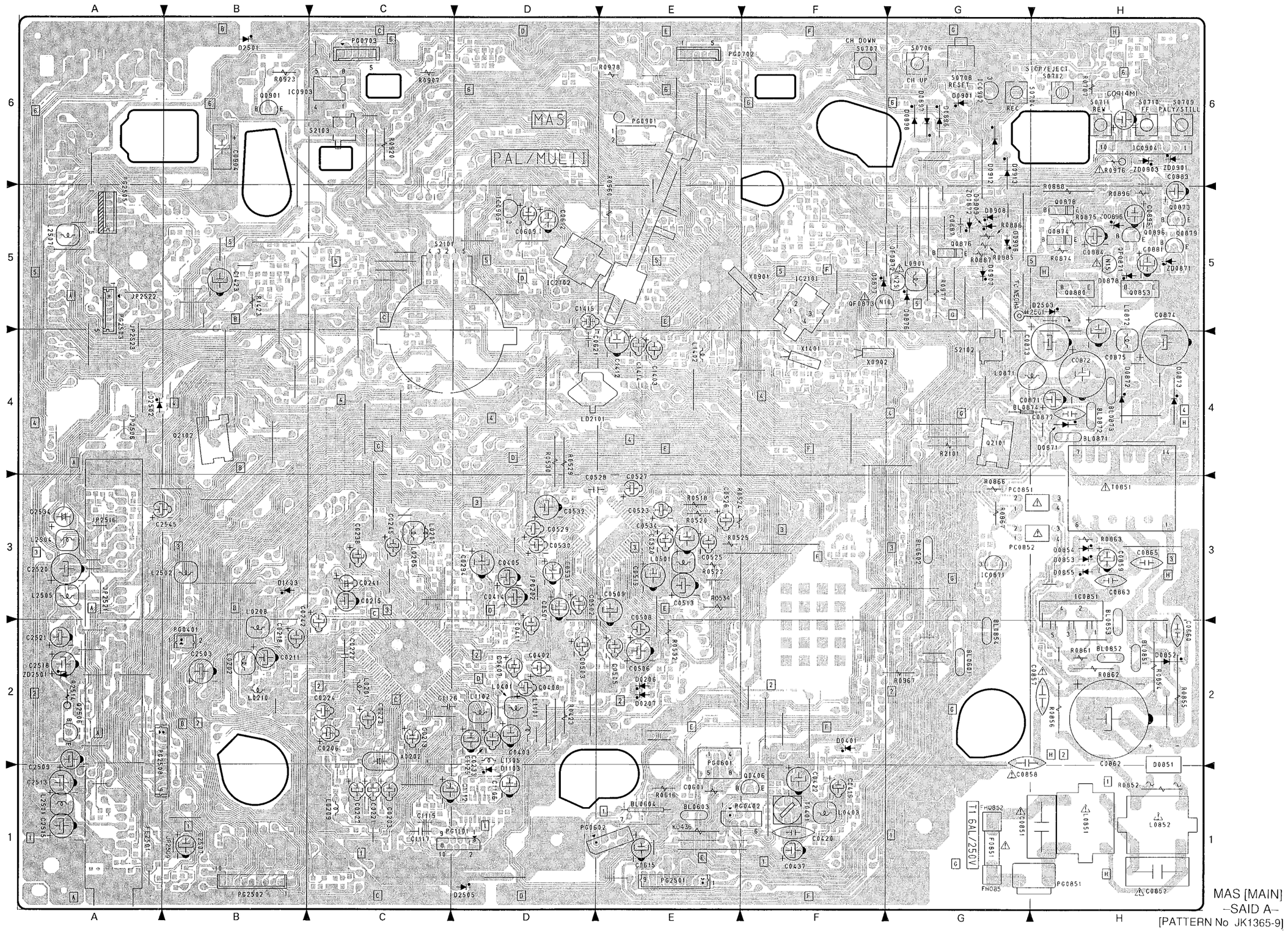


REAR JACK [RJK] SCHEMATIC DIAGRAM



REAR JACK [RJK]

MAS CIRCUIT BOARD – SIDE A –



MAS [MAIN]
–SAID A–
[PATTERN No JK1365-9]

IDENTIFICATION OF PARTS LOCATION

MAS

Symbol No	Parts Location
BL	
BL0601	A-2G
BL0602	A-3G
BL0603	A-1E
BL0604	A-1E
BL0851	A-2H
BL0852	A-2H
BL0853	A-2H
BL0854	A-2G
BL0871	A-4H
BL0872	A-4H
BL0873	A-4H
BL0874	A-4G
C	
C0201	B-3D
C0202	B-2C
C0203	A-1C
C0206	A-2C
C0207	B-2C
C0208	B-2B
C0209	B-2C
C0211	A-2B
C0213	A-2C
C0214	B-3C
C0215	A-3C
C0216	B-3C
C0218	A-2B
C0219	B-2C
C0220	A-2C
C0221	A-1C
C0222	B-1C
C0223	A-2C
C0224	A-2C
C0226	B-1C
C0227	A-1C
C0228	B-2C
C0230	B-2C
C0233	A-2D
C0234	A-3D
C0235	B-2D
C0236	B-2B
C0237	B-2B
C0238	A-3C
C0241	A-3C
C0242	A-2C
C0243	B-3C
C0244	B-2C
C0245	A-3C
C0246	B-3C
C0247	B-2B
C0249	B-3C
C0250	B-3C
C0251	B-3C
C0255	B-3D
C0256	B-3D
C0257	B-2C
C0259	B-3C
C0262	B-1C
C0263	B-1C
C0270	B-1C
C0273	B-2B
C0277	B-1C
C0278	B-2B
C0291	B-2C
C0292	B-3G
C0293	B-1C
C0296	B-2E
C0297	B-2C
C0402	A-2D
C0403	A-2D
C0404	B-2D
C0405	A-3D
C0406	B-2D
C0407	A-2D
C0408	A-2D
C0409	B-2D
C0410	B-2D
C0411	A-2D
C0413	B-2D
C0414	A-3D
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C0421	B-1F
C0422	A-1F
C0424	B-1F
C0427	B-1F
C0429	B-2D
C0434	B-2D
C0435	B-2D
C0437	A-1F
C0501	A-3D
C0502	A-3D
C0503	A-2D
C0505	A-2E
C0506	A-2E
C0507	B-2E
C0508	A-2E
C0509	A-3E
C0510	B-3E
C0511	B-3E
C0512	B-3D
C0513	A-3E
C0514	B-3E
C0517	B-3E
C0518	B-3E
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C0535	B-3D
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C0604	B-1E
C0606	B-5E
C0607	B-5D
C0608	B-5D
C0609	A-5D
C0611	B-5D
C0612	A-5D
C0614	B-1E
C0615	A-1E
C0621	A-4D
C0623	B-5D
C0624	B-5D
C0701	B-6G
C0851	A-1H
C0852	A-1H
C0857	A-2H
C0858	A-2G
C0859	A-3H
C0860	A-2H
C0862	A-2H
C0863	A-3H
C0865	A-3H
C0866	B-2H
C0871	A-4H
C0872	A-4H
C0873	A-4H
C0874	A-4H
C0875	A-4H
C0876	B-3G
C0877	A-4H
C0881	A-5H
C0882	B-5H
C0883	A-5H
C0884	A-5H
C0885	B-5G
C0886	B-5G
C0887	A-5G
C0896	A-5H
C0902	B-6C
C0903	B-5E
C0904	A-6B
C0905	B-6G
C0906	B-6G
C0907	B-5F
C0908	B-5F
C0909	B-4F
C0910	B-4F
C0912	B-6H
C0913	B-6H
C0914MI	A-6H
C0915	B-6H
C0916	B-6H
C0919	B-6E
C0922	B-6H
C0923	B-5D
C0924	B-6D
C0925	B-6D
C0926	B-6D
C0927	B-6G
C0940	B-5E
C0941	B-5E
C0945	B-5E
C0946	B-5E
C0950	B-5E
C0951	B-5E
C0982	B-6D
C1103	B-1D
C1104	B-1D
C1105	B-1D
C1106	A-1D
C1107	B-1D
C1108	B-1D
C1111	B-1D
C1112	A-1D
C1114	B-1C
C1115	A-1C
C1116	B-1C
C1117	A-1C
C1119	B-1C
C1120	B-1C
C1121	B-1C
C1122	B-1C
C1124	B-1C
C1125	A-2D
C1126	A-2C
C1127	B-2D
C1128	B-1C
C1138	B-1D
C1139	B-2D
C1140	B-2E
C1141	B-3F
C1403	A-4E
C1404	B-4E
C1409	B-4E
C1410	B-4E
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C1413	B-4E
C1414	A-4E
C1415	A-5D
C1419	B-5B
C1422	B-5B
C1423	A-5B
C1424	B-5C
C1425	B-3C
C1444	B-4F
C2101	B-4G
C2102	B-4B
C2503	A-2B
C2504	B-5B
C2507	A-1B
C2508	B-1A
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C2524	B-3A
C2525	B-3A
C2532	B-6A
C2533	B-6A
C2534	A-3A
C2540	B-3B
C2541	B-5A
C2542	B-1A
C2544	B-1A
C2545	A-3A
C2548	B-3A
D	
D0206	A-2E
D0207	A-2E
D0401	A-2F
D0851	A-2H
D0852	A-2H
D0853	A-3H
D0854	A-3H
D0855	A-3H
D0871	A-4H
D0872	A-4H
D0873	A-4H
D0876	A-5G
D0877	A-5F
D0878	A-5H
D0896	A-6G
D0897	A-6G
D0898	A-6G
D0901	A-6G
D0906	A-5G
D0907	A-5G
D0908	A-5G
D0909	A-5G
D0912	A-6G
D0913	A-6G
D1103	A-1D
D1403	A-3B
D2501	A-6B
D2502	A-4A
D2503	A-5H
D2505	A-1D
F	
F0851	A-1G
FE	
FE2501	A-1A
IC	
IC0201	B-2C
IC0501	B-3E
IC0851	A-3H
IC0871	A-3G
IC0901	B-5E
IC0902	A-6G
IC0903	A-6C
IC0904	A-6H
IC0905	A-5D
IC1102	B-1D
IC2101	A-5F
IC2102	A-5D
L	
L0201	A-2C
L0202	A-2B
L0205	A-3C
L0207	A-3C
L0208	A-2B
L0209	A-1C
L0210	A-2B
L0401	A-2D
L0403	A-1F
L0501	A-3E
L0851	A-1H
L0852	A-1H
L0871	A-4G
L0872	A-4H
L0901	A-5G
L1101	A-2D
L1102	A-2D
L1105	A-2D
L1402	A-4E
L2501	A-1A
L2502	A-3B
L2504	A-3A
L2505	A-3A
L2507	A-5A
LD	
LD2101	A-4D
PC	
PC0851	A-3H
PC0852	A-3H
PG	
PG0401	A-2B
PG0402	A-1F
PG0601	A-2E
PG0602	A-1E
PG0702	A-6E
PG0703	A-6C
PG0851	A-1H
PG0901	A-6E
PG1101	A-1D
PG2501	A-1E
PG2502	A-1B
PG2503	A-5A
PG2505	A-5A
PG2508	A-2B
Q	
Q0202	B-1C
Q0219	B-2C
Q0222	B-3D
Q0229	B-2E
Q0232	B-3D
Q0234	B-2E
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Q0405	B-2F
Q0406	A-1F
Q0411	B-1F
Q0412	B-1F
Q0413	B-1F
Q0853	A-5H
Q0859	B-5G
Q0871	B-5H
Q0873	A-5H
Q0874	A-5H
Q0875	B-5H
Q0876	A-5G
Q0877	B-5F
Q0878	A-5H
Q0879	A-5H
Q0880	A-5H
Q0896	A-5H
Q0901	A-6B
Q0902	B-6B
Q0909	B-5F
Q0913	B-5F
Q0914	B-6H
Q1104	B-1C
Q1404	B-4C
Q1407	B-5B
Q1408	B-5B
Q1409	B-5C
Q1410	B-5C
Q2101	A-4G
Q2102	A-4B
Q2103	B-5D
Q2104	B-5F
Q2501	B-1C
Q2502	B-1B
Q2503	B-1A
Q2505	B-2A
Q2506	A-2A
Q2508	B-4A
Q2511	B-3B
QF	
QF0871	A-5H
QF0872	A-5G
QF0873	A-5F
R	
R0212	B-2C
R0213	B-2C
R0215	B-1C
R0216	B-2C
R0217	B-1C
R0229	B-2C
R0230	B-2E
R0236	B-3D
R0238	B-2D
R0239	B-3C
R0241	B-3C
R0253	B-1C
R0256	B-2B
R0258	B-2B
R0261	B-2D
R0264	B-2C
R0269	B-3B
R0284	B-3C
R0402	B-2D
R0407	B-2D
R0408	B-2D
R0409	B-2D
R0410	B-2D
R0413	B-1F
R0414	B-1F
R0418	B-1F
R0419	B-2F
R0420	B-1F
R0421	B-1F
R0422	B-1F
R0423	A-2D
R0424	B-3D
R0425	B-2D
R0429	B-1F
R0430	B-1F
R0431	B-1F
R0432	B-1F
R0434	B-1F
R0450	B-2D
R0501	B-3D
R0502	B-3D
R0503	B-2D
R0504	B-2D
R0505	B-2E
R0506	B-2E
R0507	B-2E
R0508	B-2E
R0509	B-2E
R0510	B-2E
R0511	B-3E
R0512	B-3E
R0516	B-3E
R0517	B-3E
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R0519	B-3E
R0520	A-3E
R0521	B-3E
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R0523	B-3E
R0524	A-3E
R0525	A-3E
R0526	B-3D
R0527	B-3D
R0528	B-3D
R0529	A-4D
R0530	A-4D
R0531	B-3D
R0532	A-2E
R0533	B-3E
R0534	A-3E
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R0605	B-1E
R0615	B-1E
R0616	A-1E
R0621	B-4F
R0622	B-5E
R0623	B-5E
R0624	B-5E
R0625	B-5D
R0629	B-5E
R0630	B-5E
R0631	B-5D
R0632	B-5D
R0633	B-5D
R0634	B-2F
R0635	B-3F
R0636	B-2F
R0637	B-4E
R0703	B-6D
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R0706	B-6H
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R0708	B-6H
R0709	B-6H
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R0717	B-6H
R0718	B-6H
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R0863	A-3H
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R0869	B-3G
R0870	B-3G
R0871	B-4G
R0872	B-5H
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R0874	A-5H
R0875	A-5H
R0876	B-5H
R0877	B-5H
R0878	B-5H
R0879	B-5H
R0880	B-5F
R0881	B-5F
R0885	A-5G
R0886	A-5G
R0887	A-5G
R0888	A-5H
R0889	B-5H
R0890	B-5H
R0891	B-5G
R0892	B-5H
R0893	B-5H
R0894	B-5G
R0895	B-5F
R0896	A-5H
R0897	B-5H
R0906	B-6G
R0907	A-6C
R0908	B-5G
R0909	B-5G
R0910	B-5E
R0911	B-6C
R0913	B-5E
R0914	B-6D
R0915	B-6D
R0916	B-6D
R0917	B-6D
R0918	B-4C
R0919	B-6D
R0920	A-6C
R0921	B-6E
R0922	B-6E
R0923	A-6B
R0924	B-6D
R0925	B-6D
R0926	B-6D
R0928	B-6C
R0929	B-6C
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R0935	B-6G
R0936	B-6B
R0937	B-6B
R0938	B-6D
R0939	B-6D
R0940	B-5F
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R0947	B-5F
R0948	B-6G
R0949	B-5F
R0957	B-5F
R0960	A-5E
R0964	B-6D
R0965	B-2G
R0967	A-2G
R0968	B-4D
R0976	A-6H
R0977	A-5G
R0978	A-6E
R0983	B-6E
R0984	B-6E
R0985	B-6C
R0989	B-5F
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S0704	A-6G
S0706	A-6G
S0707	A-6F
S0708	A-6G
S0709	A-6H
S0710	A-6H
S0711	A-6H
S0712	A-6H
S2101	A-5C
S2102	A-4G
S2103	A-6C
T	
T0401	A-1F
T0851	A-3H
X	
X0202	A-2C
X0901	A-5F
X0902	A-4F
X1401	A-4F
ZD	
ZD0871	A-5H
ZD0872	A-5G
ZD0896	A-5H
ZD0901	A-6H
ZD0903	A-6H
ZD2501	A-2A
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R1104	B-1D
R1120	B-1D
R1121	B-3F
R1409	B-4E
R1410	B-4E
R1412	B-4E
R1414	B-3C
R1416	B-5C
R1418	B-5C
R1421	B-5B
R1423	A-5B
R1424	B-5B
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R1431	B-5C
R1432	B-4E
R1446	B-4F
R2101	A-4G
R2102	B-6C
R2103	B-5F
R2104	B-5D
R2105	B-5D
R2106	B-5D
R2107	B-5D
R2108	B-5D
R2109	B-5C
R2110	B-5C
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R2509	B-1B
R2510	B-1B
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R2512	B-1A
R2514	A-2A
R2518	B-3A
R2529	B-6A
R2530	B-6A
R2531	B-2A
R2532	B-2A
R2534	B-1B
R2535	B-4B
R2542	B-4A
R2543	B-5B

IDENTIFICATION OF PARTS LOCATION

MAS

Symbol No	Parts Location
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BL0601	A-2G
BL0602	A-3G
BL0603	A-1E
BL0604	A-1E
BL0851	A-2H
BL0852	A-2H
BL0853	A-2H
BL0854	A-2G
BL0871	A-4H
BL0872	A-4H
BL0873	A-4H
BL0874	A-4G
C	
C0201	B-3D
C0202	B-2C
C0203	A-1C
C0206	A-2C
C0207	B-2C
C0208	B-2B
C0209	B-2C
C0211	A-2B
C0213	A-2C
C0214	B-3C
C0215	A-3C
C0216	B-3C
C0218	A-2B
C0219	B-2C
C0220	A-2C
C0221	A-1C
C0222	B-1C
C0223	A-2C
C0224	A-2C
C0226	B-1C
C0227	A-1C
C0228	B-2C
C0230	B-2C
C0233	A-2D
C0234	A-3D
C0235	B-2D
C0236	B-2B
C0237	B-2B
C0238	A-3C
C0241	A-3C
C0242	A-2C
C0243	B-3C
C0244	B-2C
C0245	A-3C
C0246	B-3C
C0247	B-2B
C0249	B-3C
C0250	B-3C
C0251	B-3C
C0255	B-3D
C0256	B-3D
C0257	B-2C
C0259	B-3C
C0262	B-1C
C0263	B-1C
C0270	B-1C
C0273	B-2B
C0277	B-1C
C0278	B-2B
C0291	B-2C
C0292	B-3G
C0293	B-1C
C0296	B-2E
C0297	B-2C
C0402	A-2D
C0403	A-2D
C0404	B-2D
C0405	A-3D
C0406	B-2D
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C0424	B-1F
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C0429	B-2D
C0434	B-2D
C0435	B-2D
C0437	A-1F
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C0503	A-2D
C0505	A-2E
C0506	A-2E
C0507	B-2E
C0508	A-2E
C0509	A-3E
C0510	B-3E
C0511	B-3E
C0512	B-3D
C0513	A-3E
C0514	B-3E
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C0608	B-5D
C0609	A-5D
C0611	B-5D
C0612	A-5D
C0614	B-1E
C0615	A-1E
C0621	A-4D
C0623	B-5D
C0624	B-5D
C0701	B-6G
C0851	A-1H
C0852	A-1H
C0857	A-2H
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C0885	B-5G
C0886	B-5G
C0887	A-5G
C0896	A-5H
C0902	B-6C
C0903	B-5E
C0904	A-6B
C0905	B-6G
C0906	B-6G
C0907	B-5F
C0908	B-5F
C0909	B-4F
C0910	B-4F
C0912	B-6H
C0913	B-6H
C0914MI	A-6H
C0915	B-6H
C0916	B-6H
C0919	B-6E
C0922	B-6H
C0923	B-5D
C0924	B-6D
C0925	B-6D
C0926	B-6D
C0927	B-6G
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C1119	B-1C
C1120	B-1C
C1121	B-1C
C1122	B-1C
C1124	B-1C
C1125	A-2D
C1126	A-2C
C1127	B-2D
C1128	B-1C
C1138	B-1D
C1139	B-2D
C1140	B-2E
C1141	B-3F
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C1424	B-5C
C1425	B-3C
C1444	B-4F
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C2542	B-1A
C2544	B-1A
C2545	A-3A
C2548	B-3A
D	
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D0207	A-2E
D0401	A-2F
D0851	A-2H
D0852	A-2H
D0853	A-3H
D0854	A-3H
D0855	A-3H
D0871	A-4H
D0872	A-4H
D0873	A-4H
D0876	A-5G
D0877	A-5F
D0878	A-5H
D0896	A-6G
D0897	A-6G
D0898	A-6G
D0901	A-6G
D0906	A-5G
D0907	A-5G
D0908	A-5G
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D0913	A-6G
D1103	A-1D
D1403	A-3B
D2501	A-6B
D2502	A-4A
D2503	A-5H
D2505	A-1D
F	
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FE	
FE2501	A-1A
IC	
IC0201	B-2C
IC0501	B-3E
IC0851	A-3H
IC0871	A-3G
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IC0902	A-6G
IC0903	A-6C
IC0904	A-6H
IC0905	A-5D
IC1102	B-1D
IC2101	A-5F
IC2102	A-5D
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L0205	A-3C
L0207	A-3C
L0208	A-2B
L0209	A-1C
L0210	A-2B
L0401	A-2D
L0403	A-1F
L0501	A-3E
L0851	A-1H
L0852	A-1H
L0871	A-4G
L0872	A-4H
L0901	A-5G
L1101	A-2D
L1102	A-2D
L1105	A-2D
L1402	A-4E
L2501	A-1A
L2502	A-3B
L2504	A-3A
L2505	A-3A
L2507	A-5A
LD	
LD2101	A-4D
PC	
PC0851	A-3H
PC0852	A-3H
PG	
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PG0402	A-1F
PG0601	A-2E
PG0602	A-1E
PG0702	A-6E
PG0703	A-6C
PG0851	A-1H
PG0901	A-6E
PG1101	A-1D
PG2501	A-1E
PG2502	A-1B
PG2503	A-5A
PG2505	A-5A
PG2508	A-2B
Q	
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Q0219	B-2C
Q0222	B-3D
Q0229	B-2E
Q0232	B-3D
Q0234	B-2E
Q0403	B-1F
Q0405	B-2F
Q0406	A-1F
Q0411	B-1F
Q0412	B-1F
Q0413	B-1F
Q0853	A-5H
Q0859	B-5G
Q0871	B-5H
Q0873	A-5H
Q0874	A-5H
Q0875	B-5H
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Q0879	A-5H
Q0880	A-5H
Q0896	A-5H
Q0901	A-6B
Q0902	B-6B
Q0909	B-5F
Q0913	B-5F
Q0914	B-6H
Q1104	B-1C
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Q1408	B-5B
Q1409	B-5C
Q1410	B-5C
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Q2502	B-1B
Q2503	B-1A
Q2505	B-2A
Q2506	A-2A
Q2508	B-4A
Q2511	B-3B
QF	
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QF0872	A-5G
QF0873	A-5F
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R0215	B-1C
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R0708	B-6H
R0709	B-6H
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R0720	B-6F
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R0854	A-2H
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R0856	A-2H
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R0891	B-5G
R0892	B-5H
R0893	B-5H
R0894	B-5G
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R0896	A-5H
R0897	B-5H
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R0913	B-5E
R0914	B-6D
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R0918	B-4C
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R0946	B-5F
R0947	B-5F
R0948	B-6G
R0949	B-5F
R0957	B-5F
R0960	A-5E
R0964	B-6D
R0965	B-2G
R0967	A-2G
R0968	B-4D
R0976	A-6H
R0977	A-5G
R0978	A-6E
R0983	B-6E
R0984	B-6E
R0985	B-6C
R0989	B-5F
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R0993	B-5F
R0996	B-5F
R0997	B-6D
R0998	B-6D
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R1120	B-1D
R1121	B-3F
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R1418	B-5C
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R1431	B-5C
R1432	B-4E
R1446	B-4F
R2101	A-4G
R2102	B-6C
R2103	B-5F
R2104	B-5D
R2105	B-5D
R2106	B-5D
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R2108	B-5D
R2109	B-5C
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R2529	B-6A
R2530	B-6A
R2531	B-2A
R2532	B-2A
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R2535	B-4B
R2542	B-4A
R2543	B-5B
S	
S0704	A-6G
S0706	A-6G
S0707	A-6F
S0708	A-6G
S0709	A-6H
S0710	A-6H
S0711	A-6H
S0712	A-6H
S2101	A-5C
S2102	A-4G
S2103	A-6C
T	
T0401	A-1F
T0851	A-3H
X	
X0202	A-2C
X0901	A-5F
X0902	A-4F
X1401	A-4F
ZD	
ZD0871	A-5H
ZD0872	A-5G
ZD0896	A-5H
ZD0901	A-6H
ZD0903	A-6H
ZD2501	A-2A

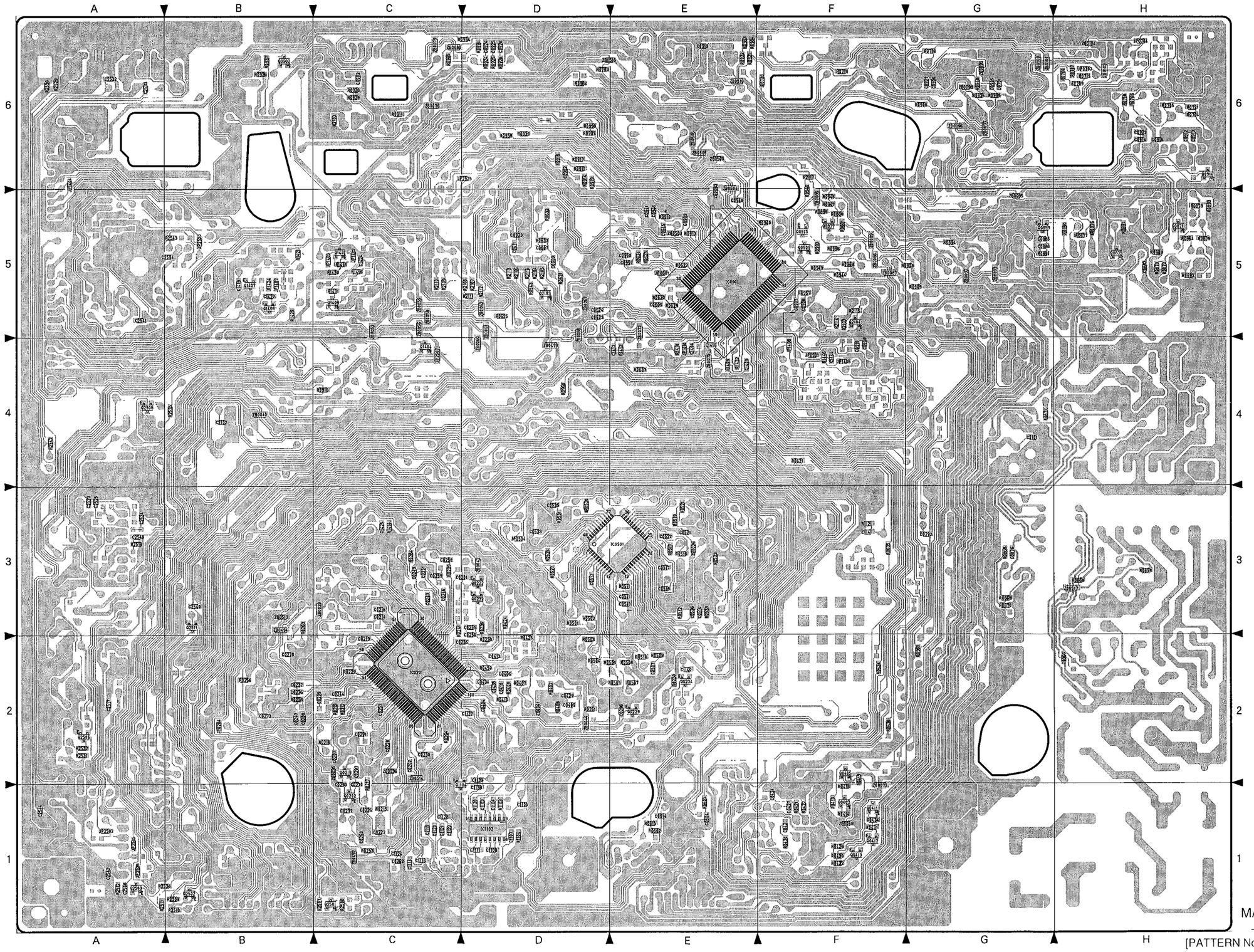
DIFFERENCE TABLE

MAS -SIDE B-

NOTE: This table listes the different components marked with asterisks (*) in the circuit board diagrams.

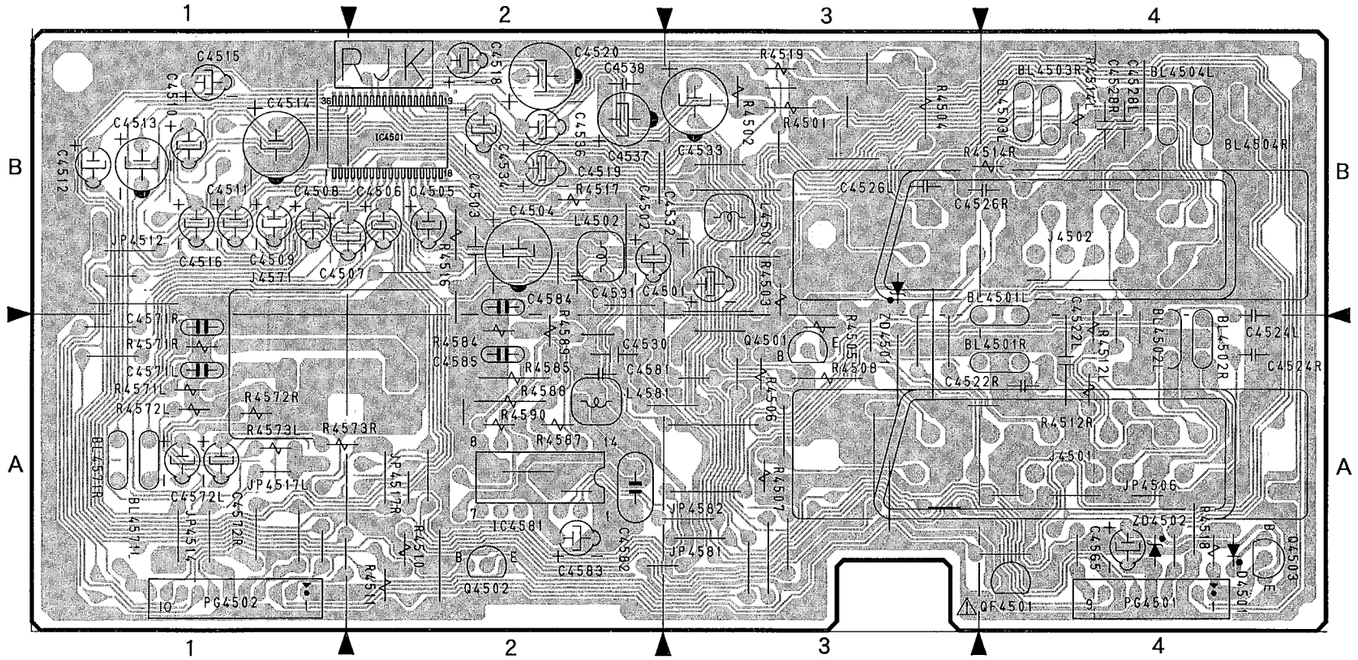
SYMBOL No.	FX-950E (UKN),(UKN)C	FX-950E (NA),(VPS)
R0910	○	×

MAS CIRCUIT BOARD – SIDE B –

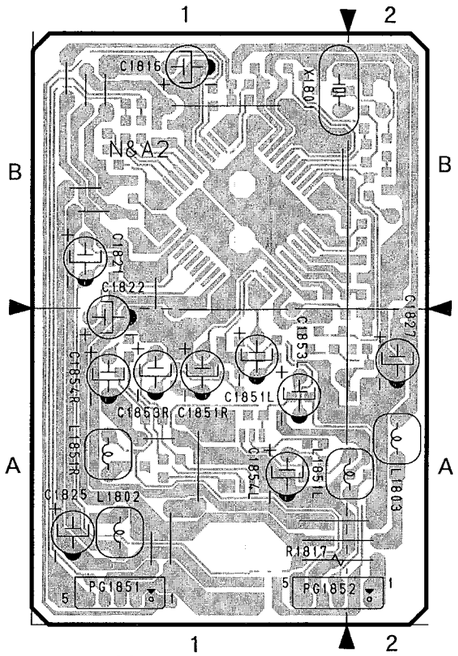


MAS [MAIN]
–SAID B–
[PATTERN No JK1365-9]

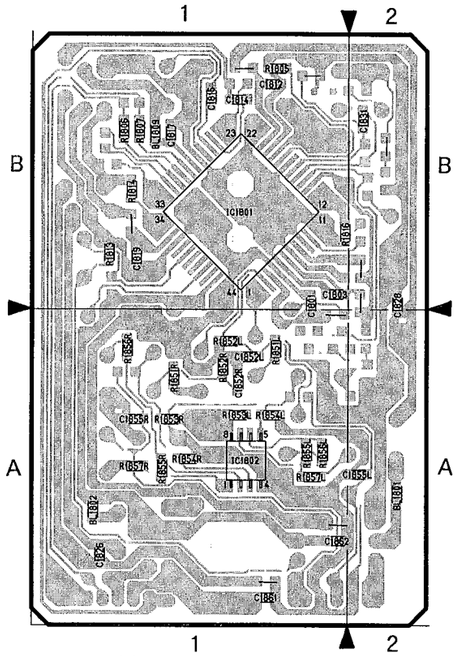
RJK, N&A CIRCUIT BOARDS



RJK [REAR JACK]
[PATTERN No. JK1433-3]



N&A [NICAM] –SAID A–



N&A [NICAM] –SAID B–
[PATTERN No. JK1360-4]
[For (UKN),(UKN)C,(NA)]

IDENTIFICATION OF PARTS LOCATION

RJK

Symbol No	Parts Location
BL	
BL4501L	4A
BL4501R	4A
BL4502L	4A
BL4502R	4A
BL4503L	4B
BL4503R	4B
BL4504L	4B
BL4504R	4B
BL4571L	1A
BL4571R	1A
C	
C4501	3B
C4502	2B
C4503	2B
C4504	2B
C4505	2B
C4506	2B
C4507	2B
C4508	1B
C4509	1B
C4510	1B
C4511	1B
C4512	1B
C4513	1B
C4514	1B
C4515	1B
C4516	1B
C4518	2B
C4519	2B
C4520	2B
C4522L	4A
C4522R	4A
C4524L	4A
C4524R	4A
C4526L	3B
C4526R	4B
C4528L	4B
C4528R	4B
C4530	2A
C4531	2B
C4532	3B
C4533	3B
C4534	2B
C4536	2B
C4537	2B
C4538	2B
C4565	4A
C4571L	1A
C4571R	1A
C4572L	1A
C4572R	1A
C4581	2A
C4582	2A
C4583	2A
C4584	2B
C4585	2A
D	

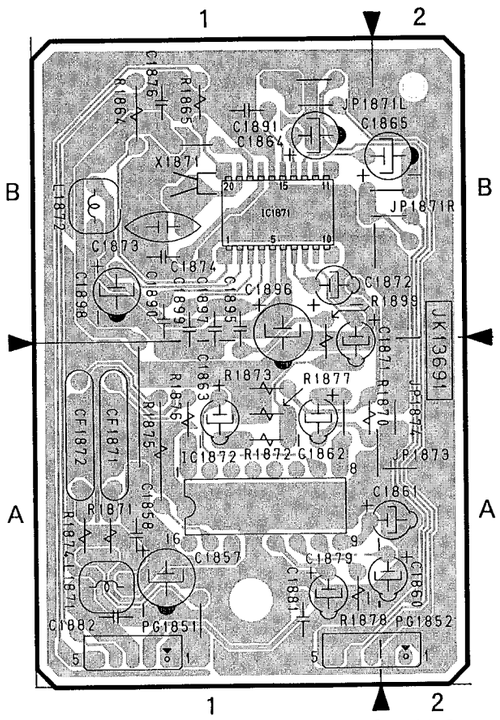
Symbol No	Parts Location
D4501	4A
IC	
IC4501	2B
IC4581	2A
J	
J4501	4A
J4502	4B
J4571	1B
L	
L4501	3B
L4502	2B
L4581	2A
PG	
PG4501	4A
PG4502	1A
Q	
Q4501	3A
Q4502	2A
Q4503	4A
QF	
QF4501	4A
R	
R4501	3B
R4502	3B
R4503	3B
R4504	3B
R4505	3A
R4506	3A
R4507	3A
R4508	3A
R4510	2A
R4511	2A
R4512L	4A
R4512R	4A
R4514L	4B
R4514R	4B
R4516	2B
R4517	2B
R4518	4A
R4519	3B
R4571L	1A
R4571R	1A
R4572L	1A
R4572R	1A
R4573L	1A
R4573R	1A
R4584	2A
R4585	2A
R4587	2A
R4588	2A
R4589	2A
R4590	2A
ZD	
ZD4501	3B
ZD4502	4A

N&A

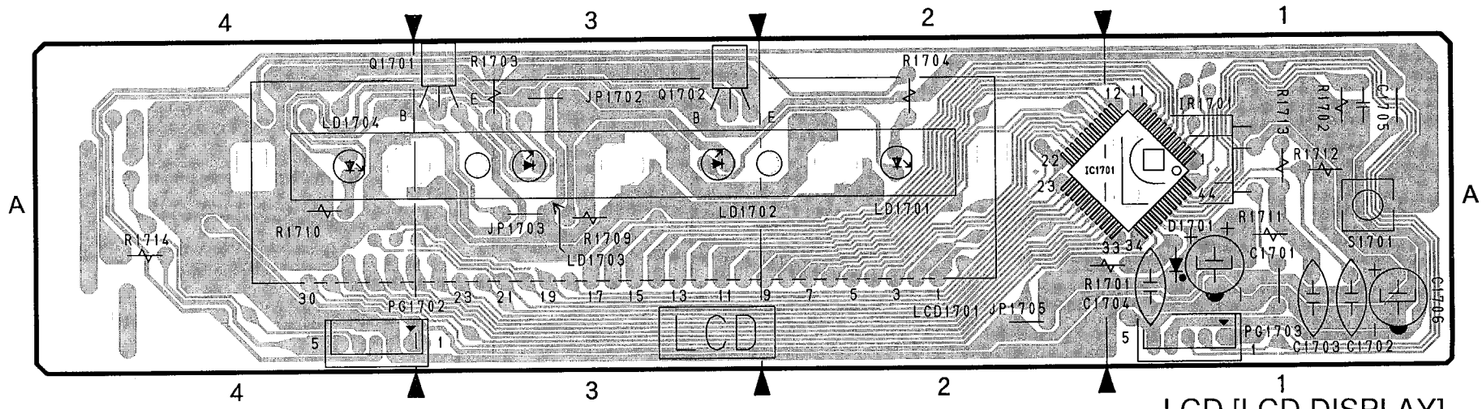
Symbol No	Parts Location
BL	
BL1801	B-2A
BL1802	B-1A
BL1809	B-1B
C	
C1801	B-1B
C1803	B-1B
C1812	B-1B
C1814	B-1B
C1815	B-1B
C1816	A-1B
C1817	B-1B
C1819	B-1B
C1821	A-1B
C1822	A-1A
C1825	A-1A
C1826	B-1A
C1827	A-2A
C1828	B-2B
C1831	B-2B
C1851L	A-1A
C1851R	A-1A
C1852L	B-1A
C1852R	B-1A
C1853L	A-1A
C1853R	A-1A
C1854L	A-1A
C1854R	A-1A
C1855L	B-2A
C1855R	B-1A
C1861	B-1A
C1862	B-1A
IC	
IC1801	B-1B
IC1802	B-1A
L	
L1802	A-1A
L1803	A-2A
L1851L	A-2A
L1851R	A-1A
PG	
PG1851	A-1A
PG1852	A-1A
R	
R1805	B-1B
R1806	B-1B
R1807	B-1B
R1813	B-1B
R1814	B-1B
R1816	B-1B
R1817	A-1A
R1851L	B-1A
R1851R	B-1A
R1852L	B-1A
R1852R	B-1A
R1853L	B-1A
R1853R	B-1A
R1854L	B-1A

Symbol No	Parts Location
R1854R	B-1A
R1855L	B-1A
R1855R	B-1A
R1856L	B-1A
R1856R	B-1A
R1857L	B-1A
R1857R	B-1A
X	
X1801	A-1B

A2, LCD CIRCUIT BOARDS



A2 [A2]
[PATTERN No. JK1369-2]
[FOR VPS]



LCD [LCD DISPLAY]
[PATTERN No. JK1361-3]

IDENTIFICATION OF PARTS LOCATION

A2

Symbol No	Parts Location
C	
C1857	1A
C1858	1A
C1860	2A
C1861	2A
C1862	1A
C1863	1A
C1864	1B
C1865	2B
C1871	1A
C1872	1B
C1873	1B
C1874	1B
C1876	1B
C1879	1A
C1881	1A
C1882	1A
C1890	1B
C1891	1B
C1895	1B
C1896	1B
C1897	1B
C1898	1B
C1899	1B
CF	
CF1871	1A
CF1872	1A
IC	
IC1871	1B
IC1872	1A
L	
L1871	1A
L1872	1B
PG	
PG1851	1A
PG1852	1A

Symbol No	Parts Location
R	
R1864	1B
R1865	1B
R1870	1A
R1871	1A
R1872	1A
R1873	1A
R1874	1A
R1875	1A
R1876	1A
R1877	1A
R1878	1A
R1899	1A
X	
X1871	1B

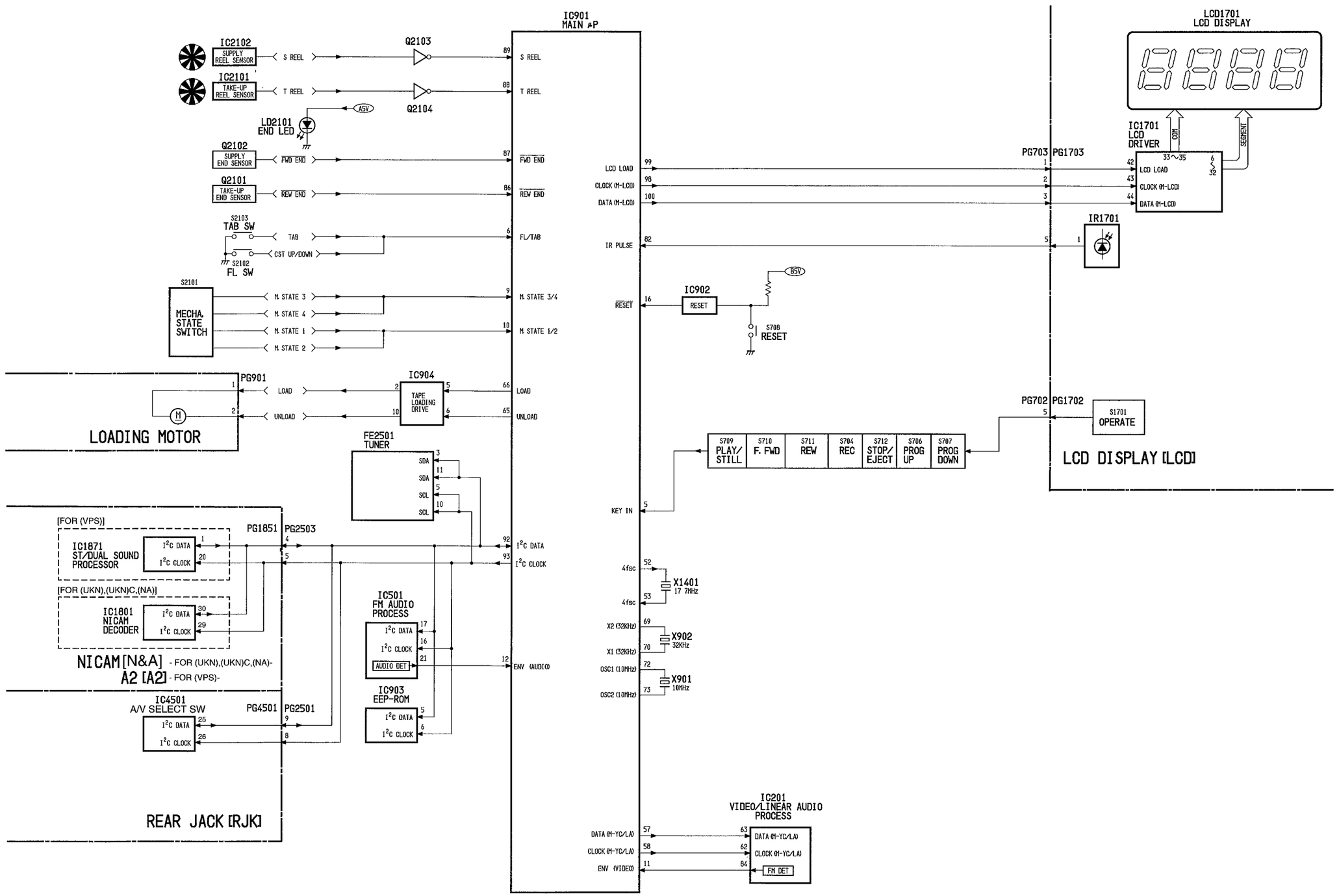
LCD

Symbol No	Parts Location
C	
C1701	4A
C1702	4A
C1703	4A
C1704	4A
C1705	4A
C1706	4A
D	
D1701	4A
IC	
IC1701	4A
IR	
IR1701	4A
LCD	
LCD1701	2A
LD	
LD1701	3A
LD1702	2A
LD1703	2A
LD1704	1A
PG	
PG1702	1A
PG1703	4A
Q	
Q1701	2A
Q1702	3A
R	
R1701	4A
R1702	4A
R1703	2A
R1704	3A
R1709	2A
R1710	1A
R1711	4A
R1712	4A
R1713	4A

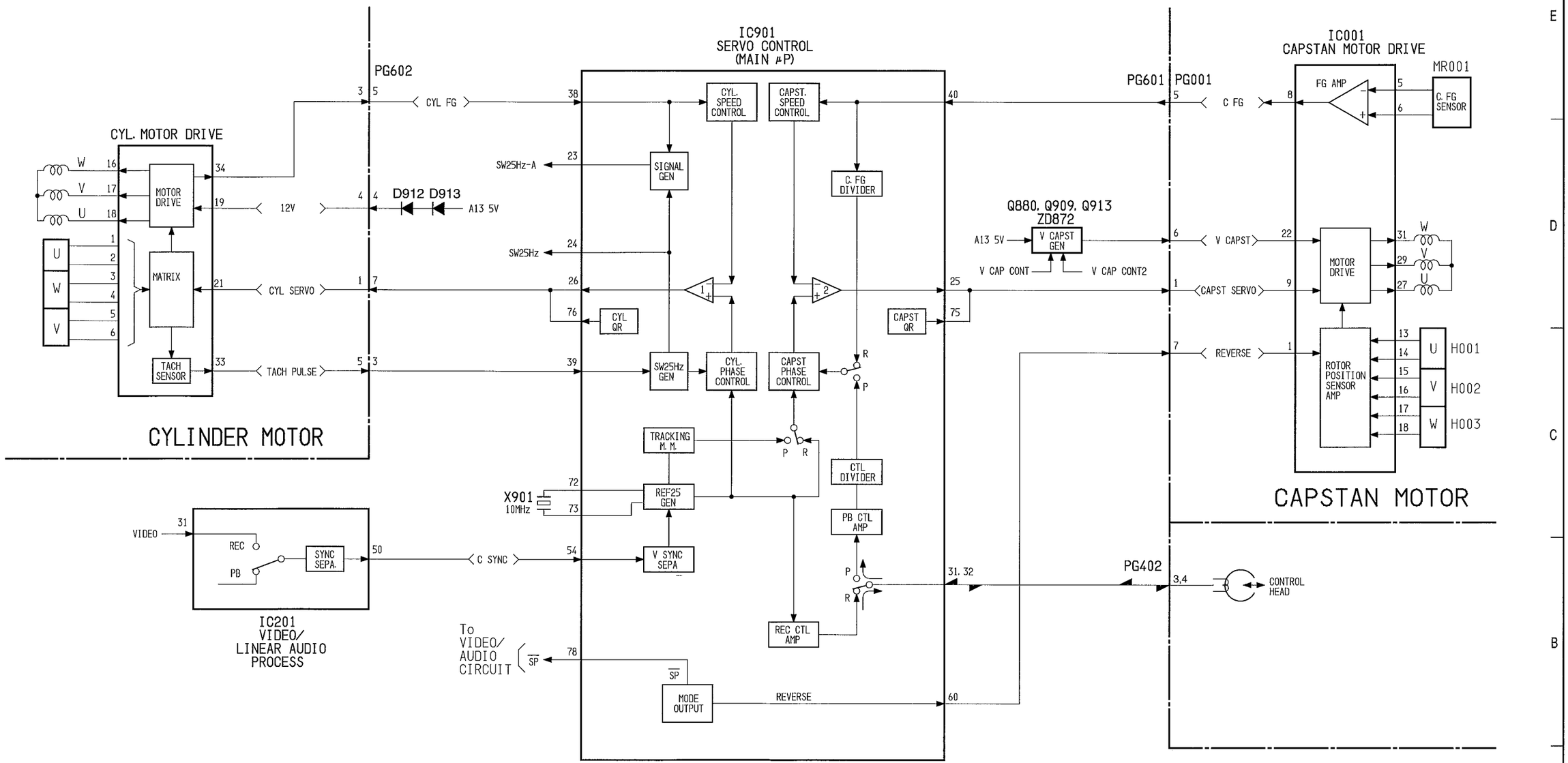
Symbol No	Parts Location
R1714	1A
S	
S1701	4A

BLOCK DIAGRAMS

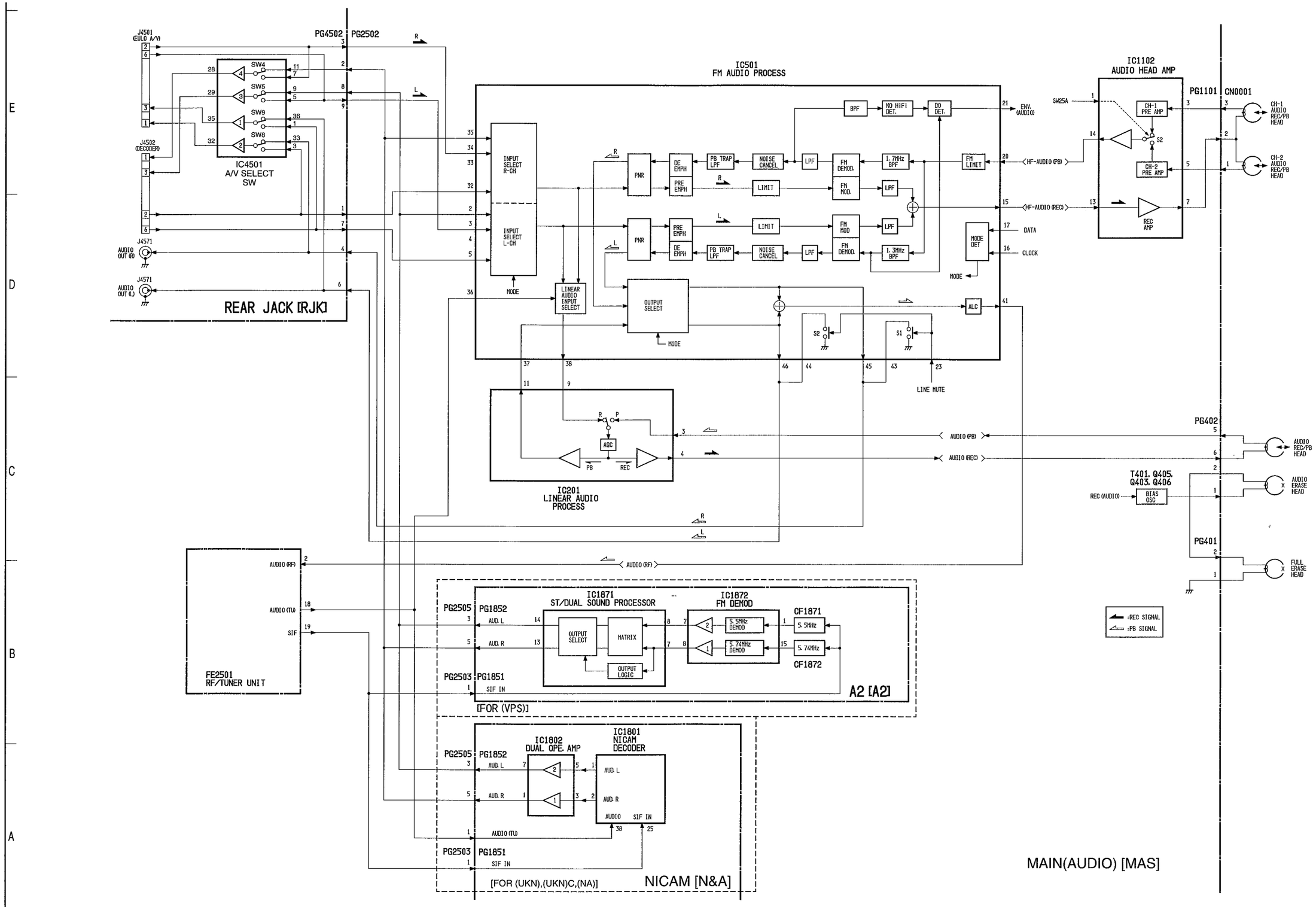
1. MAIN CONTROL



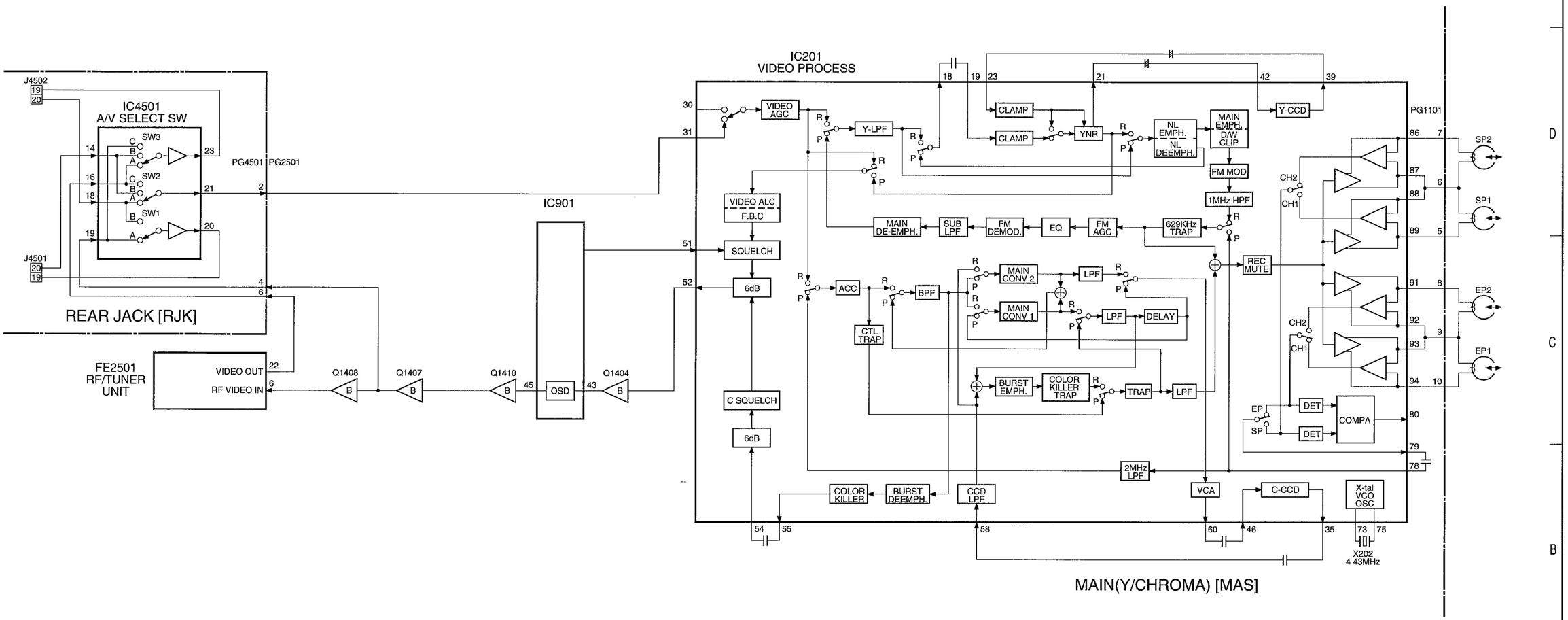
MAIN(MAIN CONTROL) [MAS]


IC901
SERVO CONTROL
(MAIN μP)
IC001
CAPSTAN MOTOR DRIVE
PG602
PG601
PG001
MR001
CYL. MOTOR DRIVE
CYLINDER MOTOR
CAPSTAN MOTOR
CYL FG
C FG
FG AMP
C. FG SENSOR
SW25Hz-A
SIGNAL GEN
CYL. SPEED CONTROL
CAPST. SPEED CONTROL
C. FG DIVIDER
D912 D913
12V
A13 5V
Q880, Q909, Q913
ZD872
V CAPST GEN
V CAP CONT
V CAP CONT2
V CAPST
CAPST SERVO
REVERSE
MOTOR DRIVE
ROTOR POSITION SENSOR AMP
SW25Hz
CYL SERVO
CYL QR
CAPST QR
MATRIX
TACH SENSOR
TACH PULSE
SW25Hz GEN
CYL. PHASE CONTROL
CAPST PHASE CONTROL
TRACKING M. M.
CTL DIVIDER
PB CTL AMP
REC CTL AMP
REF25 GEN
X901
10MHz
V SYNC SEPA
SYNC SEPA.
C SYNC
VIDEO
REC
PB
IC201
VIDEO/
LINEAR AUDIO
PROCESS
To
VIDEO/
AUDIO
CIRCUIT
MODE OUTPUT
PG402
CONTROL HEAD
MAIN(SERVO) [MAS]

3. AUDIO

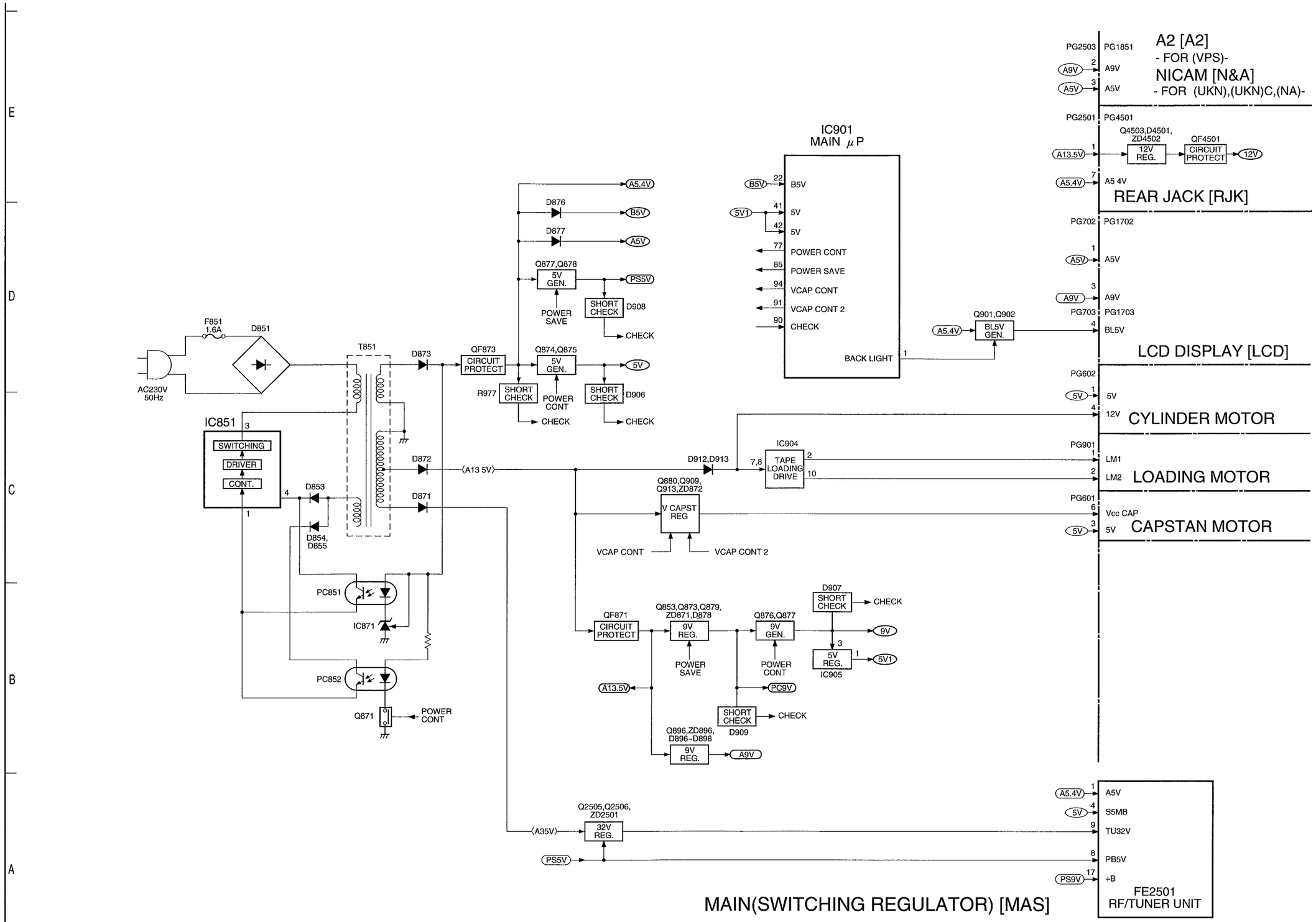

J4501
(EURO A/V)
J4502
(DECODER)
SW4
SW5
SW9
SW8
IC4501
A/V SELECT
SW
J4571
AUDIO OUT (R)
J4571
AUDIO OUT (L)
REAR JACK [RJK]
PG4502
PG2502
IC501
FM AUDIO PROCESS
INPUT SELECT R-CH
INPUT SELECT L-CH
MODE
LINEAR AUDIO INPUT SELECT
OUTPUT SELECT
PNR
DE EMPH
PRE EMPH
PB TRAP LPF
NOISE CANCEL
LPF
FM DEMOD.
FM MOD.
LIMIT
1.7MHz BPF
1.3MHz BPF
BPF
NO HIFI DET.
DD DET.
FM LIMIT
MODE DET
ALC
S1
S2
LINE MUTE
ENV. (AUDIO)
HF-AUDIO (PB)
HF-AUDIO (REC)
DATA
CLOCK
IC1102
AUDIO HEAD AMP
SW25A
CH-1 PRE AMP
CH-2 PRE AMP
REC AMP
PG1101
CN0001
CH-1 AUDIO REC/PB HEAD
CH-2 AUDIO REC/PB HEAD
PG402
AUDIO REC/PB HEAD
AUDIO ERASE HEAD
T401, Q405, Q403, Q406
REC (AUDIO)
BIAS OSC
PG401
FULL ERASE HEAD
AUDIO (PB)
AUDIO (REC)
IC201
LINEAR AUDIO PROCESS
AGC
PB
REC
AUDIO (RF)
FE2501
RF/TUNER UNIT
AUDIO (TU)
SIF
IC1871
ST/DUAL SOUND PROCESSOR
IC1872
FM DEMOD
CF1871
CF1872
5.5MHz
5.74MHz
5.5MHz DEMOD
5.74MHz DEMOD
OUTPUT SELECT
MATRIX
OUTPUT LOGIC
PG2505
PG1852
PG2503
PG1851
AUD. L
AUD. R
SIF IN
A2 [A2]
[FOR (VPS)]
IC1802
DUAL OPE. AMP
IC1801
NICAM DECODER
AUDIO
[FOR (UKN),(UKN)C,(NA)]
NICAM [N&A]
:REC SIGNAL
:PB SIGNAL
MAIN(AUDIO) [MAS]

4. VIDEO



MAIN(Y/CHROMA) [MAS]

5. POWER SUPPLY



MICROPROCESSOR PIN FUNCTION TABLES

1. LCD DRIVER μP (IC1701)

Pin No.	I/O	Active Level	Abbreviation	Function
1	-	-	SEGMENT (1)	Not used.
2	-	-	SEGMENT (2)	
|	|	|	|	
5	-	-	SEGMENT (5)	
6	O	Pulse	SEGMENT (6)	LCD segment control outputs.
7	O	Pulse	SEGMENT (7)	
|	|	|	|	
31	O	Pulse	SEGMENT (31)	
32	O	Pulse	SEGMENT (32)	
33	O	Pulse	COM1	LCD common (COM) control outputs.
34	O	Pulse	COM2	
35	O	Pulse	COM3	
36	I	Lo	RESET (L)	Initializes the LCD-μP when power is supplied.
37	I	Hi	VDD	A5V power input.
38	I	-	VDD 1	LCD drive bias.
39	I	-	VDD 2	LCD drive bias.
40	I	Lo	VSS	Ground.
41	I/O	-	OSC	Generates a 32kHz signal for key scanning.
42	I	Lo	LCD LOAD	LOAD signal between the LCD-μP and M-μP. "Lo" input enables chip select.
43	I	Pulse	CLOCK (M-LCD)	The data is transferred from the M-μP, synchronized with the clock signal.
44	I	Pulse	DATA (M-LCD)	

2. MAIN μP (IC901)

<table>
<tr><th>Pin No.</th><th>I/O</th><th>Active Level</th><th>Abbreviation</th><th>Function</th></tr>
<tr><td>1</td><td>O</td><td>Hi</td><td>BACK LIGHT</td><td>LCD backlight control signal. When LED lights: "L"; When LAMP lights: "H".</td></tr>
<tr><td>2</td><td>-</td><td>-</td><td>GND</td><td>Ground</td></tr>
<tr><td>3</td><td>I</td><td>A/D</td><td>SHUTTLE 2 (CLOCK FAST)</td><td rowspan="2">SHUTTLE A/D input signals
<table><tr><td></td><td>-X11</td><td>-X5</td><td>-X1</td><td>-X1/7</td><td>0</td><td>X1/7</td><td>X1</td><td>X5</td><td>X11</td></tr><tr><td>SHU 1</td><td>2.5/1.9</td><td>1.9/2.5</td><td>2.5</td><td>1.9</td><td>5.0</td><td>3.2</td><td>5.0</td><td>5.0/3.2</td><td>5.0/3.2</td></tr><tr><td>SHU 2</td><td>2.5</td><td>1.9</td><td>3.2</td><td>3.2/5.0</td><td>5.0</td><td>5.0/3.2</td><td>3.2</td><td>1.9</td><td>2.5</td></tr></table>CLOCK FAST when SHUTTLE 2 is 5 V or less</td></tr>
<tr><td>4</td><td>I</td><td>A/D</td><td>SHUTTLE 1</td></tr>
<tr><td>5</td><td>I</td><td>A/D</td><td>KEY IN</td><td>Front key voltage data input</td></tr>
<tr><td>6</td><td>I</td><td>A/D</td><td>FL/TAB</td><td>FL mechanism loading/unloading detection, and TAB detection. Loading/unloading completed: 1.24 V or more; In transition state: less than 1.24 V / TAB present: 3.75 V or more</td></tr>
<tr><td>7</td><td>I</td><td>Lo</td><td>P. STOP</td><td>Power failure detection signal. "L" is input when power failure is detected ("L" when microprocessor voltage is 4.7 V or less).</td></tr>
<tr><td>8</td><td>I</td><td>Hi</td><td>S. CURVE</td><td>Fine tuning detection signal</td></tr>
<tr><td>9</td><td>I</td><td>A/D</td><td>MODE 2</td><td rowspan="2">Mechanism mode switching signals
<table><tr><td>Position</td><td>2
UL</td><td>8
FF/REW</td><td>7
STP2</td><td>6
R/P</td><td>1
FL</td><td>5
FS</td><td>4
RFS</td><td>3
REV</td></tr><tr><td>MODE 1</td><td>3.05</td><td>3.0</td><td>2.50</td><td>1.80</td><td>1.80</td><td>0.00</td><td>0.00</td><td>0.00V</td></tr><tr><td>MODE 2</td><td>2.50</td><td>0.00</td><td>2.50</td><td>3.05</td><td>0.00</td><td>3.05</td><td>2.50</td><td>1.80V</td></tr></table></td></tr>
<tr><td>10</td><td>I</td><td>A/D</td><td>MODE 1</td></tr>
<tr><td>11</td><td>I</td><td>A/D</td><td>VIDEO ENV</td><td rowspan="2">Signals are A/D converted and input for autotracking</td></tr>
<tr><td>12</td><td>I</td><td>A/D</td><td>AUDIO ENV</td></tr>
<tr><td>13</td><td>I</td><td>A/D</td><td>MDOEL SW</td><td>Switches models according to the input signal.</td></tr>
<tr><td>14</td><td>I</td><td>A/D</td><td>DEC IN</td><td>DECODER detection signal</td></tr>
<tr><td>15</td><td>I</td><td>-</td><td>VREF</td><td>A/D converter reference voltage</td></tr>
<tr><td>16</td><td>I</td><td>Lo</td><td>RESET</td><td>"L" input resets the microprocessor.</td></tr>
<tr><td>17</td><td>O</td><td>-</td><td>NC</td><td></td></tr>
<tr><td>18</td><td>O</td><td>Hi</td><td>ST/SAP OUT</td><td>Not used.</td></tr>
<tr><td>19</td><td>O</td><td>Hi</td><td>GREEN MODE</td><td>Not used.</td></tr>
<tr><td>20</td><td>O</td><td>-</td><td>NC</td><td></td></tr>
<tr><td>21</td><td>O</td><td>-</td><td>NC</td><td></td></tr>
<tr><td>22</td><td>I</td><td>-</td><td>VCC</td><td>Connected to backup power supply.</td></tr>
<tr><td>23</td><td>O</td><td>Pulse</td><td>SW25A</td><td>SW25 pulse for switching Hi-Fi heads</td></tr>
<tr><td>24</td><td>O</td><td>Pulse</td><td>SW25</td><td>SW25 pulse for switching WYC heads</td></tr>
<tr><td>25</td><td>O</td><td>PWM</td><td>CAP PWM</td><td>Capstan motor control PWM output</td></tr>
<tr><td>26</td><td>O</td><td>PWM</td><td>DRUM PWM</td><td>Drum motor control PWM output</td></tr>
<tr><td>27</td><td>O</td><td>Hi</td><td>V. PULSE</td><td>Artificial V sync pulse output</td></tr>
<tr><td>28</td><td>O</td><td>Pulse</td><td>C. ROTARY</td><td>Not used.</td></tr>
<tr><td>29</td><td>O</td><td>Hi/Lo</td><td>H. AMP SW</td><td>Not used.</td></tr>
<tr><td>30</td><td>I</td><td>Hi/Lo</td><td>COMP</td><td>Compares outputs from SP and LP heads: when the LP head output is higher, "H" is input.</td></tr>
<tr><td>31</td><td>I/O</td><td>Pulse</td><td>CTL H (+)</td><td>CTL pulse input/output</td></tr>
<tr><td>32</td><td>I/O</td><td>Pulse</td><td>CTL H (-)</td><td>CTL pulse input/output</td></tr>
<tr><td>33</td><td>-</td><td>-</td><td>Vss (SRV)</td><td>GND</td></tr>
<tr><td>34</td><td>I</td><td>Pulse</td><td>CTL AMP I1</td><td>CTL amp gain switching input</td></tr>
<tr><td>35</td><td>I</td><td>Pulse</td><td>CTL AMP I2</td><td>CTL amp negative feedback input</td></tr>
<tr><td>36</td><td>I</td><td>Pulse</td><td>CTL AMP I3</td><td>CTL amp input</td></tr>
<tr><td>37</td><td>O</td><td>Pulse</td><td>CTL AMP (0)</td><td>CTL amp output</td></tr>
<tr><td>38</td><td>I</td><td>Pulse</td><td>DRUM FG</td><td>Drum FG input</td></tr>
<tr><td>39</td><td>I</td><td>Pulse</td><td>DRUM PG</td><td>Drum PG input</td></tr>
<tr><td>40</td><td>I</td><td>Pulse</td><td>CFG</td><td>CFG input signal</td></tr>
<tr><td>41</td><td>I</td><td>-</td><td>Vcc (SRV)</td><td>S5V power supply for SRV</td></tr>
</table>

Pin No.	I/O	Active Level	Abbreviation	Function
42	I	-	Vcc (OSD)	S5V power supply for OSD
43	I	-	CV IN	Video signal input (2 Vp-p, with sync tip clamp circuit)
44	I	-	Vref	Reference bias, clamp bias monitor pin
45	O	-	CV OUT	Composite video signal output (2 Vp-p)
46	I	-	CHAR Bias	For externally adjusting character luminance level
47	I	-	AFC LPF	An LPF for AFC is externally attached.
48	I	-	AFC OSC	Oscillator for AFC
49	I	-	GND (OSD)	Ground
50	I	Pulse	DOSC IN	LC or RC oscillator for generating dot clock
51	O	Pulse	DOSC OUT	LC or RC oscillator for generating dot clock
52	O	-	4fsc OUT	4fsc or 2fsc oscillator
53	I	-	4fsc IN	4fsc or 2fsc oscillator
54	I	Pulse	C. SYNC	C.SYNC input for video output
55	O	Hi	BLUE BACK	"H" during OSD blue background
56	O	Hi	HiFi REC	Hi-Fi audio recording signal. REC and V.DUB: "H". REC PAUSE and V.DUB PAUSE. "L".
57	I/O	Pulse	12C DATA (AV)	I2C communication data signal
58	O	Pulse	12C CLK (AV)	I2C communication clock signal
59	O	Lo	PB	Sets the video system to the playback mode. During playback: "L".
60	O	Hi	REVERSE	Capstan motor reverse control output ("H" for reverse drive)
61	O	Hi	A. REC	Linear audio recording signal. REC, A.DUB and A.DUB PAUSE: "H". REC PAUSE: "L"
62	O	Hi	CTL RESET	Adds reset pulse to CTL during REVERSE SLOW
63	O	Hi/Lo	PAL/NTSC	Video switching. NTSC playback: "L", PAL playback: "H". The output is fixed at "L" for models without PAL or NTSC playback.
64	O	Pulse	IR OUT	IR output that controls cable box (satellite decoder). The output is fixed at "L" for models without SAT.
65	O	Hi	LM2 (UNLOAD)	Loading motor control outputs.
66	O	Hi	LM1 (LOAD)	
67	O	Hi/Lo	LM CONT	Loading motor voltage control output
68	-	-	TEST	Ground
69	I	-	XCIN	For the connection of 32.768kHz crystal oscillator (tolerance: within ±5 ppm)
70	O	-	XCOUT	
71	I	-	GND	Ground
72	I	-	XIN	For the connection of 10MHz ceramic oscillator (tolerance: within ±0.50 ppm)
73	O	-	XOUT	
74	O	Hi	L. MUTE	Audio output system muting control. "H": Muting ON (used in common with FTZ muting)
75	I/O	Hi/Lo	CAPS Q. R	Capstan control signal. "H": Voltage control, "OPEN": Servo control, "L": Braking
76	I/O	Hi/Lo	DRUM Q. R	Cylinder control signal. Horizontal jitter correction.
77	O	Hi	POWER CONT	Switches S power supply on and off. "H": Power ON, "L": Power OFF (or "OPEN": When microprocessor is initialized)
78	O	Lo	SP	Not used.
79	I	Hi/Lo	MESECAM DET	MESECAM signal detection input. When MESECAM signal detected: "H". Not connected and fixed at "L" for PAL models, not handling MESECAM signal.
80	O	Hi	REC	Video signal recording control. REC LED control signal. During REC, REC PAUSE, V.DUB, V.DUB PAUSE: "H".
81	O	Hi	MTS MUTE	Tuner audio muting signal. During playback, line input: "H". During MPX muting for channel switching: "H"

	Stop	Loading	Unloading	Brake
LM1 (LOAD)	L	H	L	H
LM2 (UNLOAD)	L	L	H	H

<table>
<tr><th>Pin No.</th><th>I/O</th><th>Active Level</th><th>Abbreviation</th><th>Function</th></tr>
<tr><td>82</td><td>I</td><td>Pulse</td><td>IR. IN</td><td>Remote control receiving signal</td></tr>
<tr><td>83</td><td>O</td><td>-</td><td>NC</td><td></td></tr>
<tr><td>84</td><td>I</td><td>Hi</td><td>CCD CE</td><td>CCD microprocessor chip enable</td></tr>
<tr><td>85</td><td>O</td><td>Hi</td><td>P. SAVE</td><td>Detects VPS/PDC programming status and switches S power on and off.
Power ON: "H", Power OFF: ""L", Standby with VPS/PDC programming: "H"</td></tr>
<tr><td>86</td><td>I</td><td>Lo</td><td>EST</td><td rowspan="2">End sensor inputs.
1. Used to detect whether or not a cassette is loaded into the US mechanism.
With cassette: ESS or EST is "H".
Without cassette: Both ESS and EST are "L".
2. Used to detect the start and end of tape.
Tape start: EST "L" and ESS "H". Tape end: EST "H" and ESS "L".</td></tr>
<tr><td>87</td><td>I</td><td>Lo</td><td>ESS</td></tr>
<tr><td>88</td><td>I</td><td>Pulse</td><td>T. REEL</td><td>Reel pulses for detecting rotation of take-up reel disk</td></tr>
<tr><td>89</td><td>I</td><td>Pulse</td><td>S. REEL</td><td>Reel pulses for detecting rotation of supply reel disk</td></tr>
<tr><td>90</td><td>I</td><td>Lo</td><td>CHECK</td><td>Signal to detect short-circuit in S5V, S9V, PS5V and PS9V.</td></tr>
<tr><td>91</td><td>O</td><td>Hi/Mid/Lo</td><td>V. CAP. CONT 2</td><td rowspan="2">Sets capstan motor voltage during playback, fast forward/rewind and slow.
<table>
<tr><th colspan="3">FF/REW</th></tr>
<tr><td>FF/REW</td><td>91, 94</td><td>V</td></tr>
<tr><td>During S.L acceleration</td><td>L L</td><td>13.5</td></tr>
<tr><td>Less than EPX1</td><td>L L</td><td>13.5</td></tr>
<tr><td>EPX1-SPX6</td><td>L H</td><td>9.5</td></tr>
<tr><td>More than SPX6</td><td>L L</td><td>13.5</td></tr>
<tr><td>Low-speed FF/REW</td><td>L L</td><td>13.5</td></tr>
</table>
*13.5 V in modes other than above (pins 91 and 94 are "L")
<table>
<tr><th colspan="3">PB/REC/SR</th></tr>
<tr><td></td><td>91, 94</td><td>V</td></tr>
<tr><td>X1</td><td>H H</td><td>7.5</td></tr>
<tr><td>X3-X5</td><td>L H</td><td>9.5</td></tr>
<tr><td>X7</td><td>L L</td><td>13.5</td></tr>
</table>
<table>
<tr><th colspan="3">SLOW</th></tr>
<tr><td></td><td>91, 94</td><td>V</td></tr>
<tr><td>BRAKE</td><td>L H</td><td>9.5</td></tr>
<tr><td>SP ACCEL</td><td>L L</td><td>13.5</td></tr>
</table></td></tr>
<tr><td>94</td><td>O</td><td>Hi/Mid/Lo</td><td>V. CAP. CONT</td></tr>
<tr><td>92</td><td>I/O</td><td>Pulse</td><td>12C DATA</td><td>I2C communication data signal</td></tr>
<tr><td>93</td><td>O</td><td>Pulse</td><td>12C CLOCK</td><td>I2C communication clock signal</td></tr>
<tr><td>95</td><td>O</td><td>Pulse</td><td>CCD CLOCK</td><td>Clock signal for CCD communications</td></tr>
<tr><td>96</td><td>I</td><td>Pulse</td><td>CCD DATA IN</td><td>CCD data input</td></tr>
<tr><td>97</td><td>O</td><td>Pulse</td><td>CCD DATA OUT</td><td>CCD data output</td></tr>
<tr><td>98</td><td>O</td><td>Pulse</td><td>LCD CLOCK</td><td>Clock for serial data output to LCD</td></tr>
<tr><td>99</td><td>O</td><td>Hi</td><td>LCD CE</td><td>Data load signal to LCD</td></tr>
<tr><td>100</td><td>O</td><td>Pulse</td><td>CCD DATA</td><td>Serial data to LCD</td></tr>
</table>

HITACHI

VT-FX950E(NA)
VT-FX950E(UKN)
VT-FX950E(UKN)C
VT-FX950E(VPS)

TK No.5010E Digital Media Products Division, Tokai

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Printed in Japan (II)

HITACHI

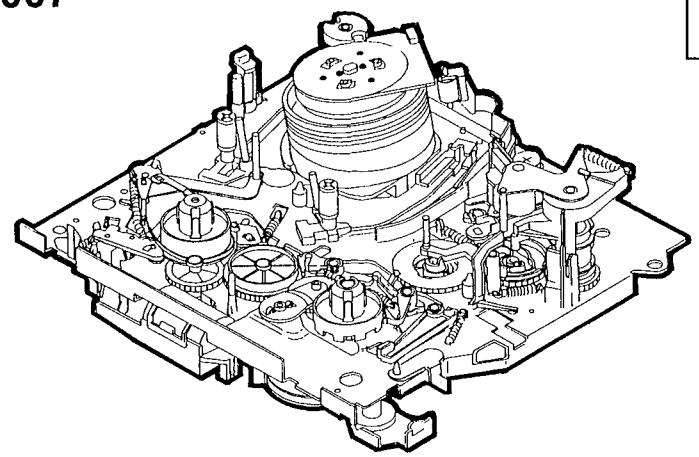
SERVICE MANUAL

V17007

TK | No.4527E

US Mechanism

This service manual includes the procedures to dismantle, adjust and maintain the US mechanism. Use this together with the manual of each VCR model.



VHS
SVHS

Please read this service manual throughly before servicing. Be sure to observe the cautions described in this manual so the safety of the product can be maintained.

SPECIFICATIONS AND PARTS ARE SUBJECT TO CHANGE FOR IMPROVEMENT

VIDEO CASSETTE RECORDER

October 1995 Video & Personal Media Systems Division, Tokai Operation

SAFETY PRECAUTIONS

NOTICE: Comply with all cautions and safety related notes located on or inside the cabinet and on the chassis.

1. When replacing a chassis in the instrument, all the protective devices must be put back in place, such as barriers, non-metallic knobs, adjustment and compartment covers/shields, isolation resistors/capacitors, etc.
2. When service is required, observe the original lead-dress. Extra precautions should be taken to assure correct lead dress in the high voltage circuit.
3. Always use the manufacturer's replacement components. Especially critical components as indicated on the circuit diagram should not be replaced by other manufacturers'. Furthermore, where a short-circuit has occurred, replace those components that indicate evidence of overheating.
4. Before returning an instrument to the customer, the service technician must thoroughly test the unit to be certain that it is completely safe to operate without danger of electrical shock, and be sure that no protective device built into the instrument by the manufacturer has become defective or inadvertently defeated during servicing. Therefore, the following checks should be performed for the continued protection of the customer and service technician.

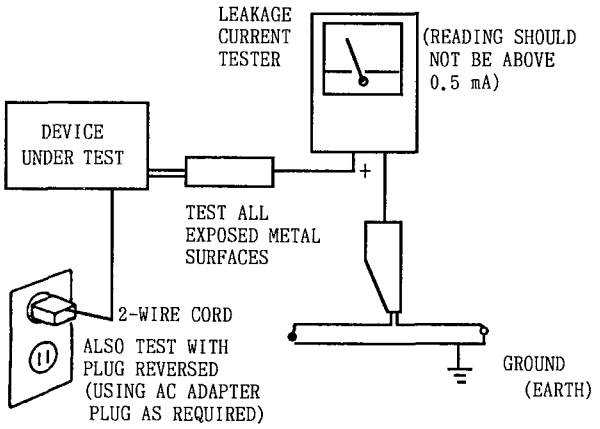
Leakage Current Cold Check

With the AC plug removed from the AC120V, 60Hz source, place a jumper across the two plug prongs. Turn the AC power switch on. Using an insulation tester (DC500V), connect one lead to the jumpered AC plug and touch the other lead to exposed metal parts (antennas, screwheads, metal overlays, control shafts, etc.), particularly any exposed metal part having a return path to the chassis. Exposed metal parts having a return path to the chassis should have a minimum resistor reading of 0.3 Mohm and a maximum resistor reading of 5 Mohm. Any resistor value below or above this range indicates an abnormality which requires corrective action. Exposed metal parts not having a return path to the chassis will indicate an open circuit.

Leakage Current Hot Check

Plug the AC line cord directly into a AC120V, 60Hz outlet (do not use an isolation transformer for this check).

Turn the AC power switch on. Using a "Leakage Current Tester", measure for current from all exposed metal parts of the cabinet (antennas, screwheads, metal overlays, control shaft, etc.), particularly an exposed metal part having a return path to the chassis, to a known ground (earth) (water pipe, conduit, etc.). Any current measured must not exceed 0.5 mA.



AC Leakage Test

ANY MEASUREMENTS NOT WITHIN THE LIMITS OUTLINED ABOVE ARE INDICATIVE OF A POTENTIAL SHOCK HAZARD AND MUST BE CORRECTED BEFORE RETURNING THE UNIT TO THE CUSTOMER.

PRODUCT SAFETY NOTICE

Many electrical and mechanical parts have special safety-related characteristics. These are often not evident from visual inspection nor can the protection afforded by them necessarily be obtained by using replacement components rated for a higher voltage, wattage, etc. Replacement parts which have these special safety characteristics are identified in this Service Manual. Electrical components having such features are identified by marking with a ⚠ on the schematics and the parts list in this Service Manual. The use of a substitute replacement component which does not have the same safety characteristics as the HITACHI recommended replacement one, shown in the parts list in this Service Manual, may create shock, fire, or other hazards. Product safety is continuously under review and new instructions are issued from time to time. For the latest information, always consult the current HITACHI Service Manual. A subscription to, or additional copies for, HITACHI Service Manual may be obtained at a nominal charge from HITACHI SALES CORPORATION.

CONTENTS

CHAPTER 1 GENERAL INFORMATION

Appearances of US Mechanism 1-1
How to Remove the Cassette when a Malfunction Has Occurred in the Mechanism 1-3

CHAPTER 2 DISASSEMBLY

1. Before Starting Disassembly 2-1
2. Identifications and Locations of Components of US Mechanism..... 2-1
3. US Mechanism Disassembly Method 2-2
   Removal of Heads and Motors 2-2
   Removal of Tape Transport Parts 2-2
   Removal of Tape Drive Parts 2-3
   Removal of Guide Roller Assemblies 2-3
   Disassembly Procedure Diagrams 2-4
   3-1. FE head 2-4
   3-2. A/C head 2-4
   3-3. Cylinder motor assembly 2-4
   3-4. Capstan motor 2-4
   3-5. Loading motor 2-5
   3-6. Tension arm, tension band and jog arm 2-5
   3-7. Supply subbrake, supply reel disk, brake (L), idler gears 1 and 2 2-5
   3-8. Impedance roller and HC mechanism .. 2-6
   3-9. Pressure roller arm 2-6
   3-10. Spiral gear and P. out arm 2-6
   3-11. PR idler gear 2-7
   3-12. FS brake and P. drive gear 2-7
   3-13. Brake (R), Take-up brake, take-up reel disk and FR arm 2-8
   3-14. Safety arm 2-8
   3-15. Cam gear and LM wheel gear 2-8
   3-16. Loading gears (R) and (L) 2-9
   3-17. Pulley assembly, drive belt, torque change arm, torque change gear, FR drive gear and transmission gear 2-9
   3-18. FL idler gear and FL change gear ... 2-10
   3-19. Slider 2-10
   3-20. Cylinder base and guide roller assemblies 2-10
   Item to Check After Reinstalling the US Mechanism 2-11
4. Identifications and Locations of Parts in US-FL Mechanism 2-12
5. Procedure to Dismantle the US-FL Mechanism 2-12
   5-1. Door arm, switch arm, bevel gear and FL gear 2-12
   5-2. Side brackets (R) and (L), cassette holder and FL drive arm 2-13

CHAPTER 3 MECHANICAL ADJUSTMENT

1. List of Adjustment Jig 3-1
2. Diagram showing Adjustment Locations 3-1
3. Tape Transport Component Adjustments 3-2
   3-1. Reel disk height adjustment 3-2
   3-2. Tension pole position check 3-3
   3-3. Guide roller height adjustment 3-3
   3-4. Audio/control (A/C) head adjustment .. 3-5
   3-5. Adjustments after replacing the cylinder 3-6
   3-6. Tension/Torque checks 3-7

CHAPTER 4 MECHANISM OPERATION CHECK AND MAINTENANCE/INSPECTION

Mechanism Operation Check 4-1
   1. Method to set the VCR to the loading state without loading a cassette 4-1
   2. Checking the operation in each mode 4-2
Maintenance/Inspection Procedure 4-3
   1. Necessity of Maintenance and Inspection 4-3
   2. Scheduled Maintenance and Inspection ... 4-3
   3. Before Determining that the VCR is Faulty 4-3
   4. Tools Needed for Inspection and Maintenance 4-4
   5. Cleaning Procedure 4-4
   6. lubricating and greasing 4-4
   7. Maintenance/Inspection Schedules of Mechanical Parts 4-5

CHAPTER 5 EXPLODED VIEWS

1. US-MECHANISM (TOP VIEW) SECTION 5-1
2. US-MECHANISM (BOTTOM VIEW) SECTION 5-2
3. US-FL MECHANISM SECTION 5-3

Identifications of Components in US Mechanism 5-4

CHAPTER 1 GENERAL INFORMATION

Appearances of US Mechanism

1. Top View of US Mechanism (I)

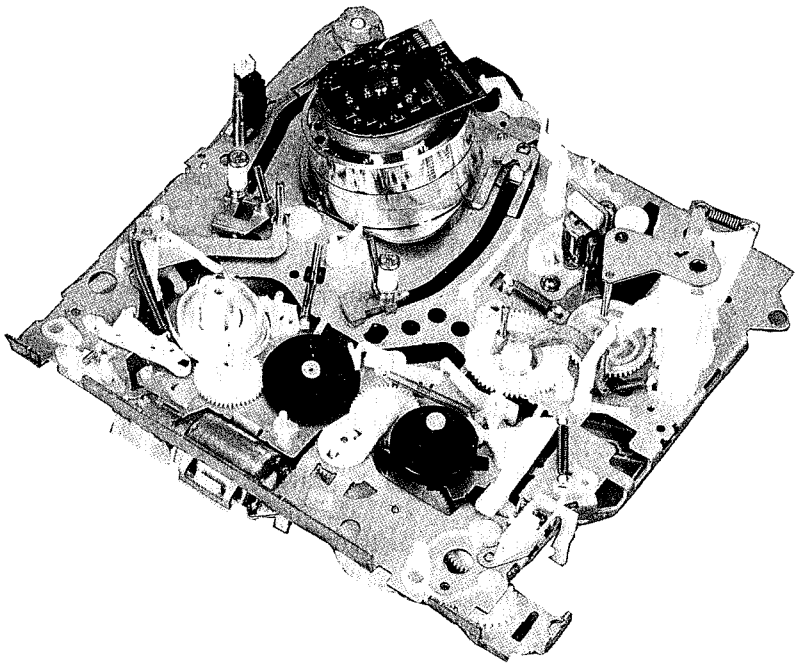


Fig. 1-1

2. Top View of US Mechanism (II)

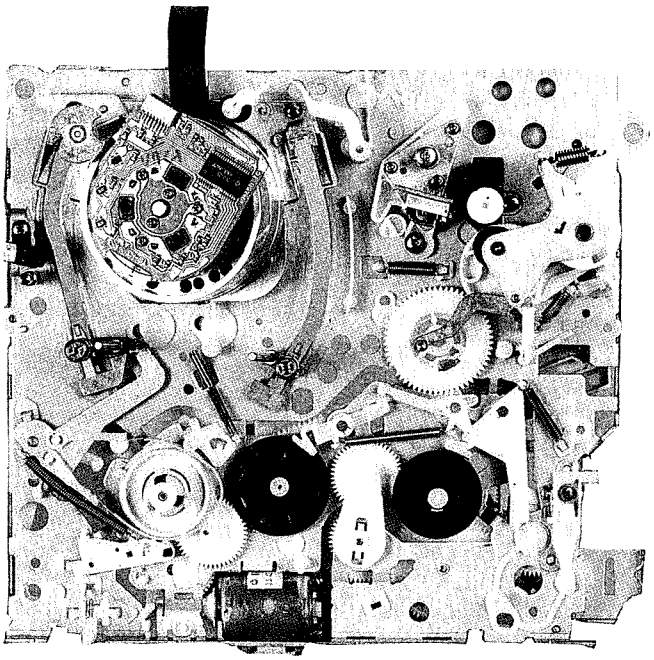


Fig. 1-2

3. Bottom View of US Mechanism (I)

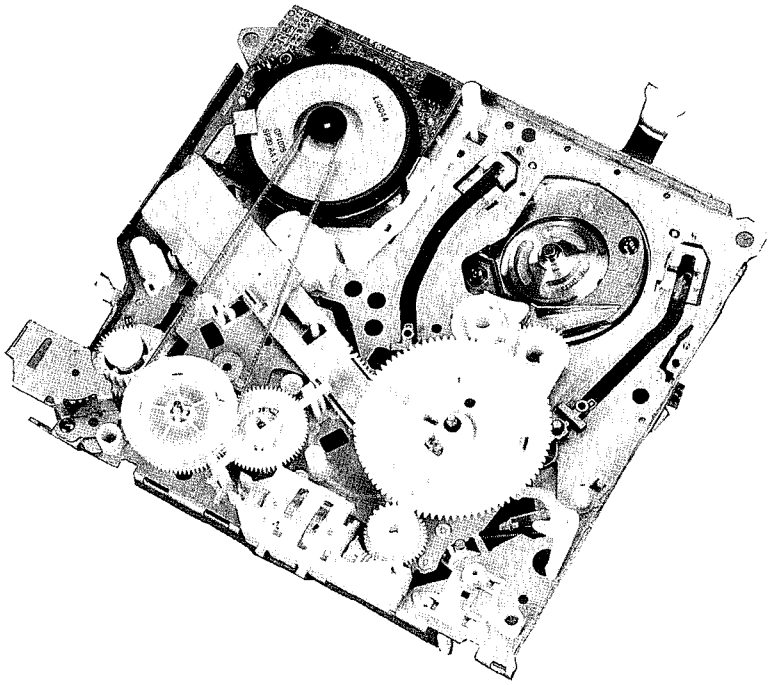


Fig. 1-3

4. Bottom View of US Mechanism (II)

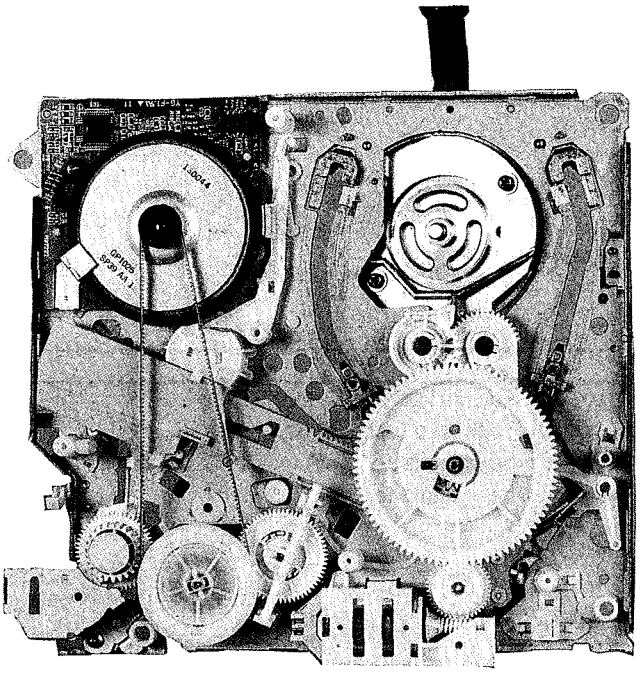


Fig. 1-4

How to Remove the Cassette when a Malfunction Has Occurred in the Mechanism

If a cassette is caught in the mechanism because of a malfunction in the mechanism, remove it by the following procedure.

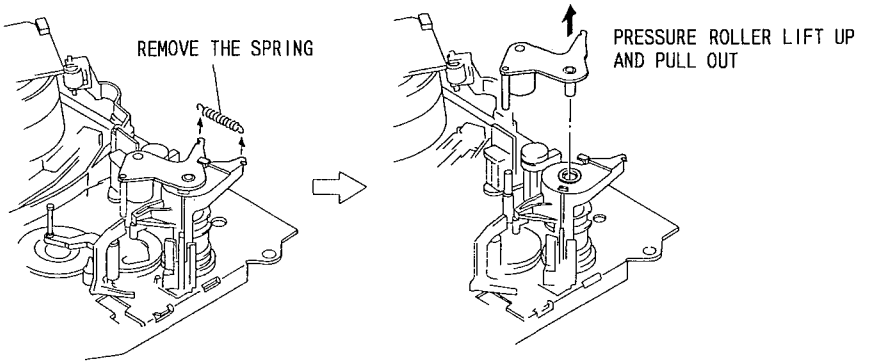
[Work Procedure]

1. Remove the top cover.
2. Remove the front panel.

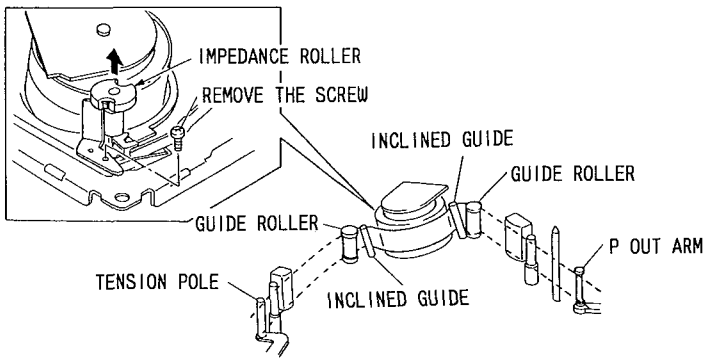
If the tape is wound round the cylinder in the loading state

If the cassette does not come out from the FL mechanism in the unloading state.

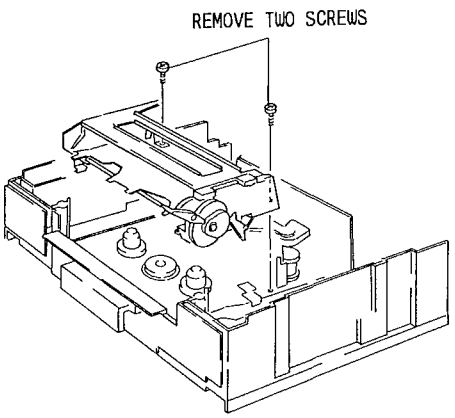
Remove the spring and lift the pressure roller to pull it out.



1) Remove the screw and lift the impedance roller together with the impedance plate.
2) Slacken the tape and release it from the tension pole, guide rollers, inclined guides and P out arm.



1) Remove two screws holding the FL mechanism.
2) Hold the cassette lid with your fingers so the tape is not damaged and remove the FL mechanism.
3) Remove the slack tape and eject the cassette.



CHAPTER 2 DISASSEMBLY

1. Before Starting Disassembly

1) Unplug the power cord from the AC outlet.
2) [Removal procedure]
   If a special procedure is required when dismantling any component, it is indicated using numbers. Follow the numbers (①, ②, ③ ...) shown in the illustrations.

[Reinstallation procedure]
Reinstall each component in the reverse order to removal when otherwise not specified.

2. Identifications and Locations of Components of US Mechanism

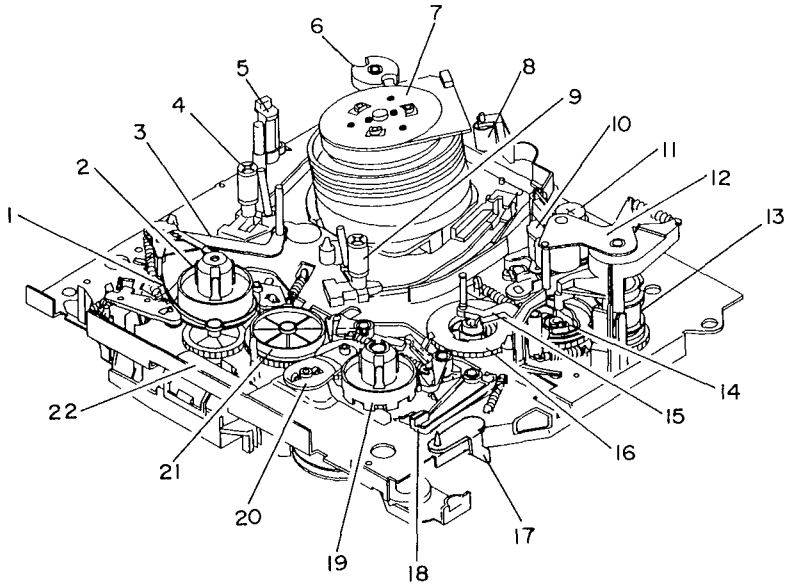


Fig. 2-1 Top View of US Mechanism

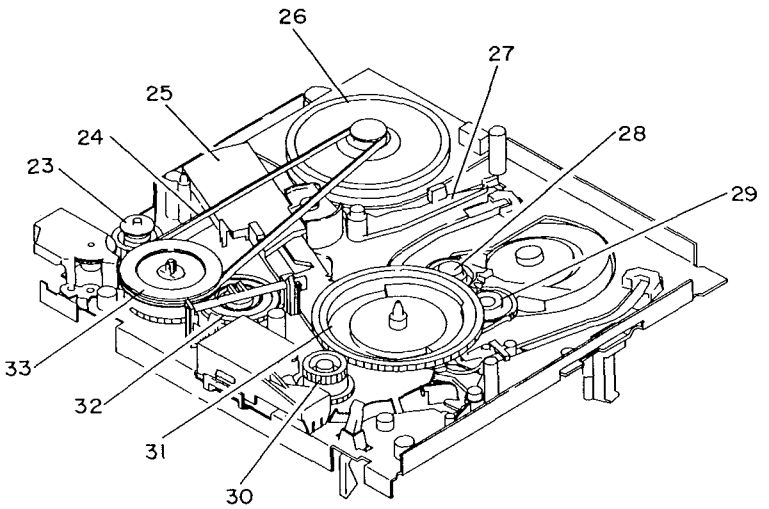


Fig. 2-2 Bottom View of US Mechanism

1. Tension band
2. Supply reel disk
3. Tension arm
4. Supply guide roller
5. Full erase (FE) head
6. Impedance roller
7. Cylinder motor
8. HC mechanism
9. Take-up guide roller
10. Audio/control (A/C) head
11. Capstan shaft
12. Pressure roller arm
13. Spiral gear
14. PR idler gear
15. P. out arm
16. P. drive gear
17. S-VHS switch (S-VHS VCR only)
18. Take-up brake
19. Take-up reel disk
20. FR arm
21. Idler gear 2
22. Loading motor
23. FL change gear
24. Drive belt
25. Slider
26. Capstan motor
27. FS brake
28. Loading gear (R)
29. Loading gear (L)
30. LM wheel gear
31. Cam gear
32. Torque change gear
33. Pulley assembly

3. US Mechanism Disassembly Method

When replacing defective parts, first refer to the "parts hierarchy chart" shown below. This chart shows the procedure for parts removal when replacing defective parts.

[How to use the parts hierarchy chart]

(1) Locate the part to be replaced.
(2) Check the parts in the ranks above the part to be replaced and start dismantling.
(3) Replace the defective part and reinstall the parts in the reverse order to that shown in the parts hierarchy chart.

Removal of Heads and Motors

Note: Dismantle parts in the eject state.

Parts to remove	Item
FE head	3-1
A/C head	3-2
★ Cylinder motor	3-3
★ Capstan motor	3-4
★ Loading motor	3-5

Removal of Tape Transport Parts

Note: Dismantle parts in the eject state.

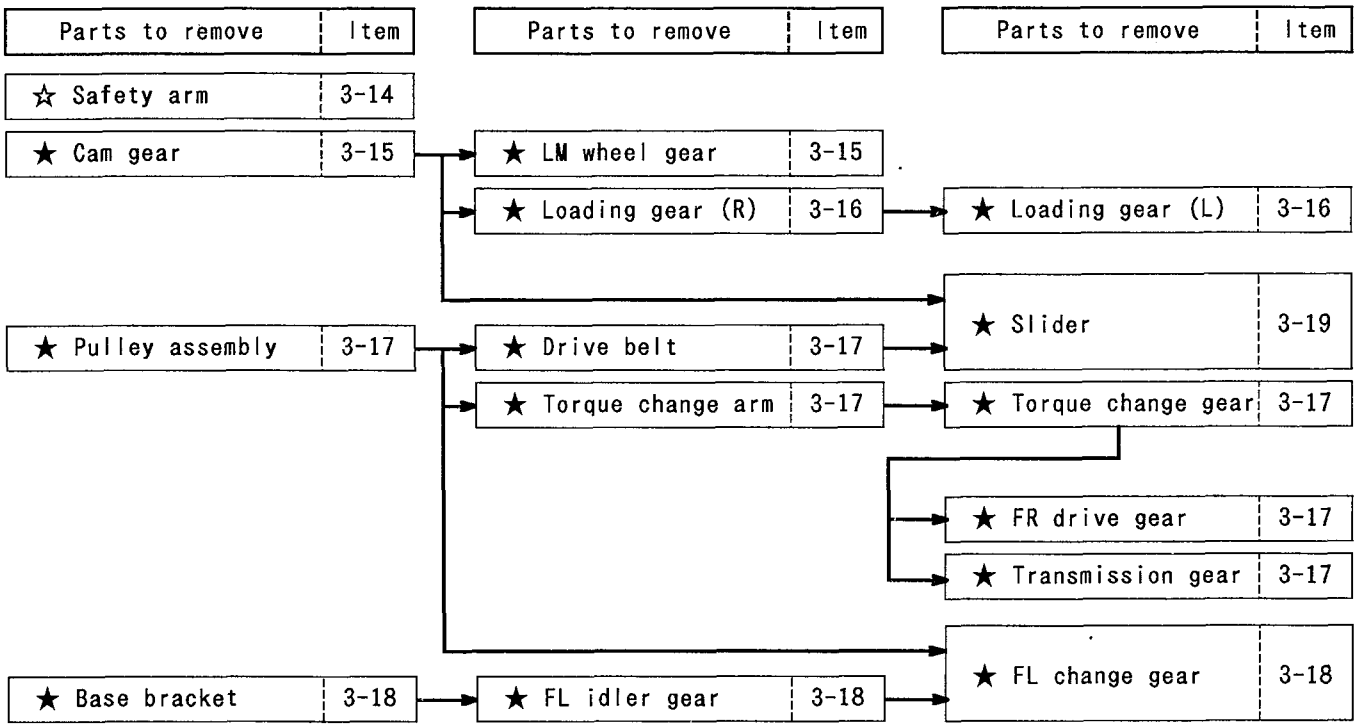
Parts to remove	Item	Parts to remove	Item	Parts to remove	Item
☆ Tension arm	3-6	☆ Tension band	3-6		
		☆ Jog arm	3-6		
		☆ Supply subbrake	3-7	☆ Supply reel disk	3-7
☆ Brake (L)	3-7	☆ Idler gear 2	3-7	☆ Idler gear 1	3-7
Impedance plate	3-8	Impedance roller	3-8		
HC mechanism	3-8	★ FS brake	3-12		
Pressure roller arm	3-9	☆ Spiral gear	3-10		
☆ P. out arm	3-10	☆ PR Idler gear	3-11	★ P. drive gear	3-12
☆ Brake (R)	3-13	☆ Take-up brake	3-13		
		☆ Take-up reel disk	3-13	☆ FR arm	3-13

◆ How to interpret the symbols

- Dismantle the parts marked ☆ after the FL mechanism has been removed.
- Dismantle the parts marked ★ after the US mechanism has been removed from the VCR.
- The parts without any marks can be replaced with the top cover removed.

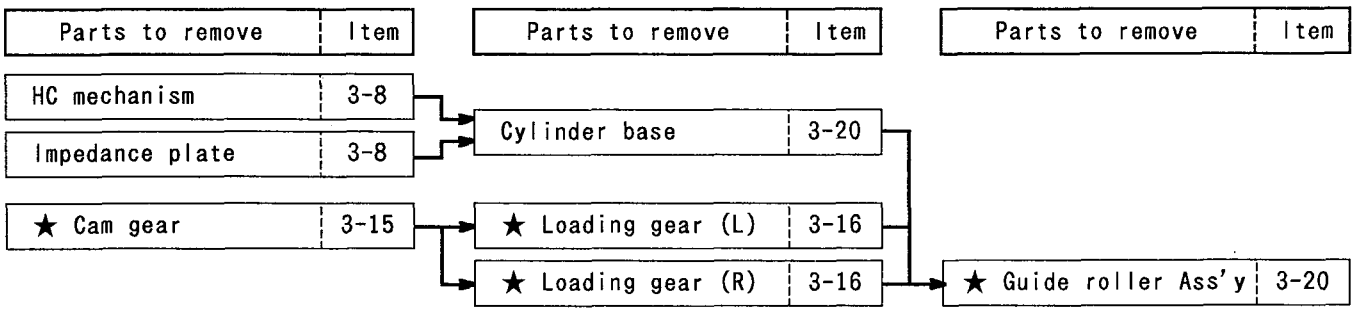
Removal of Tape Drive Parts

Note: Dismantle parts in the eject state.



Removal of Guide Roller Assemblies

Note: Dismantle parts in the eject state.



◆ How to interpret the symbols

- Dismantle the parts marked ☆ after the FL mechanism has been removed.
- Dismantle the parts marked ★ after the US mechanism has been removed from the VCR.
- The parts without any marks can be replaced with the top cover removed.

3-1. FE head

◆ Caution when reinstalling

1) Clean the surfaces of the FE head and supply guide roller with which the tape comes into contact.

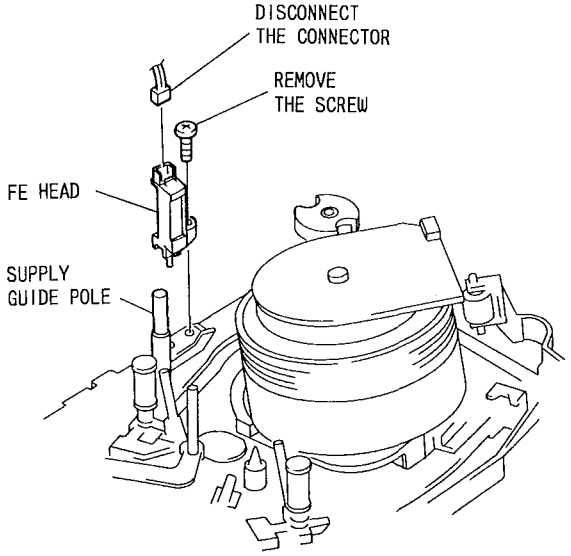


Fig. 3-1

3-2. A/C head

◆ Caution when reinstalling

1) Clean the surface of the A/C head with which the tape comes into contact.

◆ Mechanism adjustment after reinstalling

1) Audio/control (A/C) head adjustment

◆ Electrical adjustment after reinstalling

1) X-value adjustment

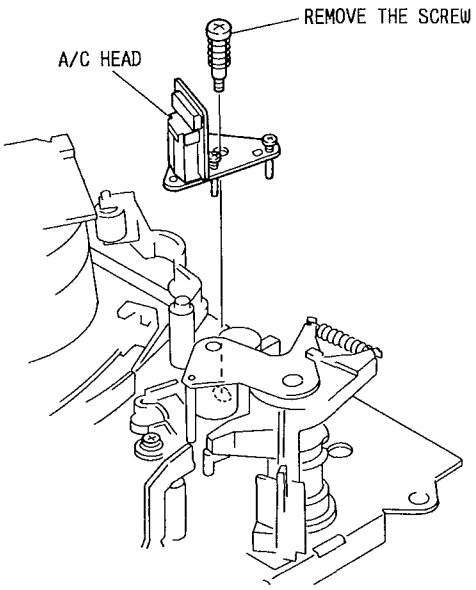


Fig. 3-2

3-3 Cylinder motor assembly

◆ Caution during work

1) Do not touch the video head tips.

◆ Mechanism adjustment after reinstalling

1) Adjustments after replacing the cylinder

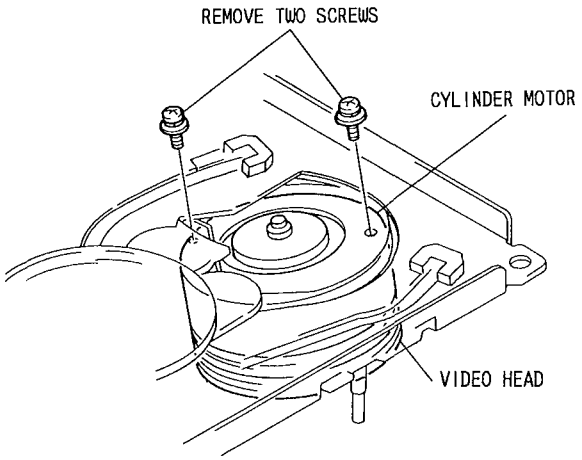


Fig. 3-3

3-4. Capstan motor

◆ Caution when reinstalling

1) Clean the surface of the capstan shaft with which the tape comes into contact.

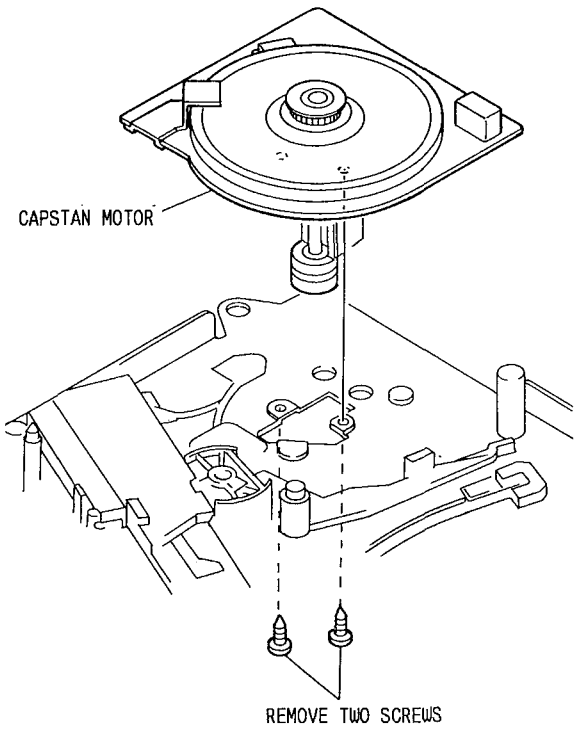


Fig. 3-4

3-5. Loading motor

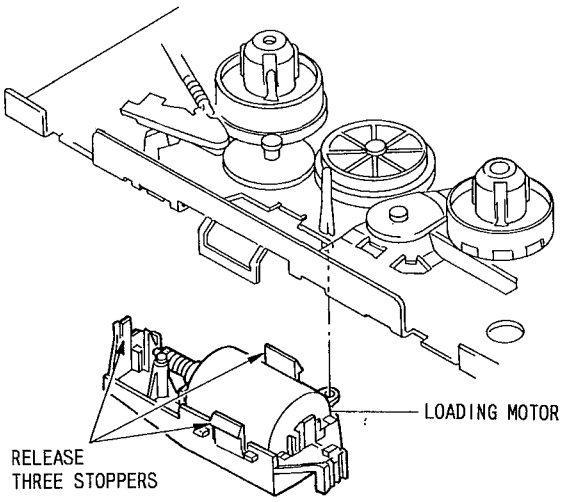


Fig. 3-5

3-6. Tension arm, tension band and jog arm

◆ Caution when reinstalling

1) Clean the surface of the tension pole with which the tape comes into contact.

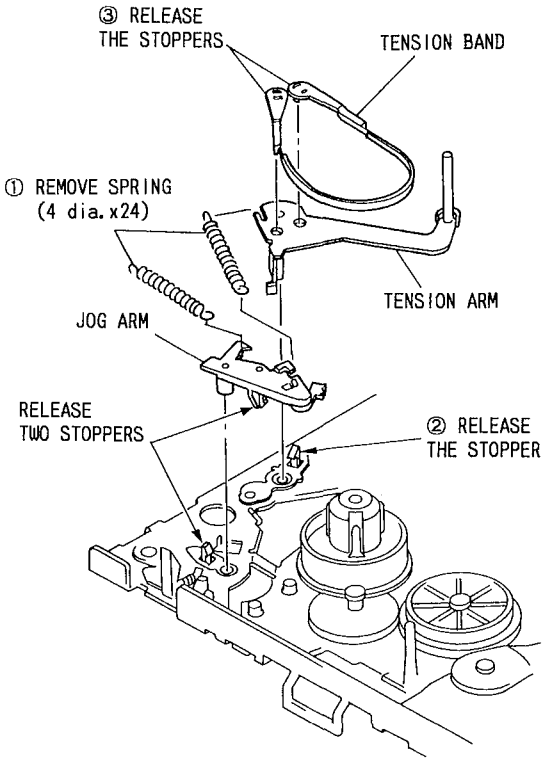


Fig. 3-6

3-7. Supply subbrake, supply reel disk, brake (L), idler gears 1 and 2

◆ Mechanism adjustment after reinstalling

1) Reel disk height adjustment

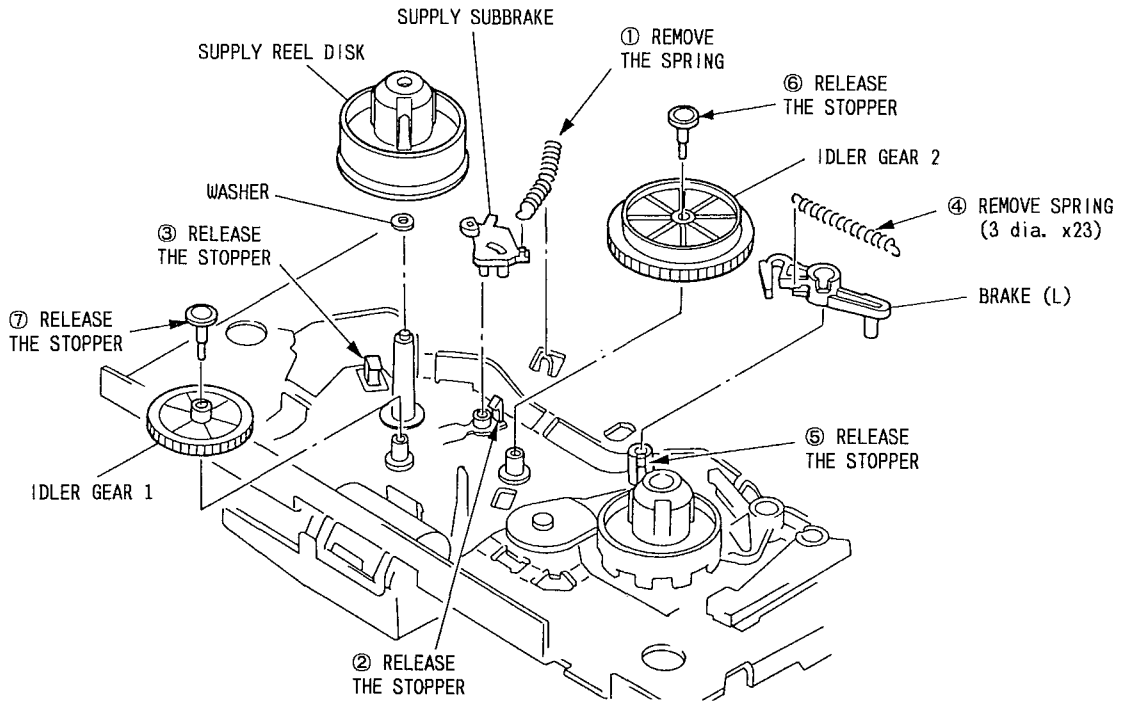


Fig. 3-7

3-8. Impedance roller and HC mechanism

◆ Caution when reinstalling

1) Check that the HC mechanism arm is set to the specified position.

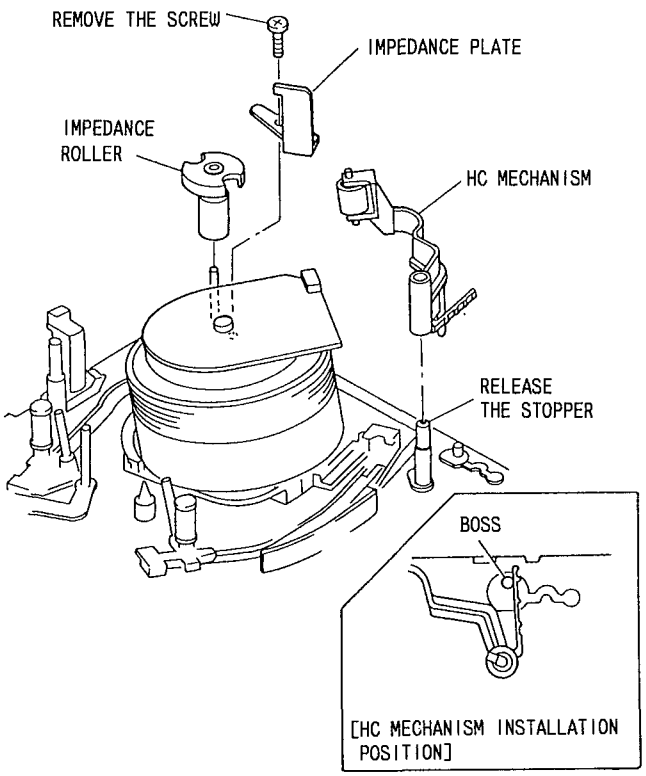


Fig. 3-8

3-9. Pressure roller arm

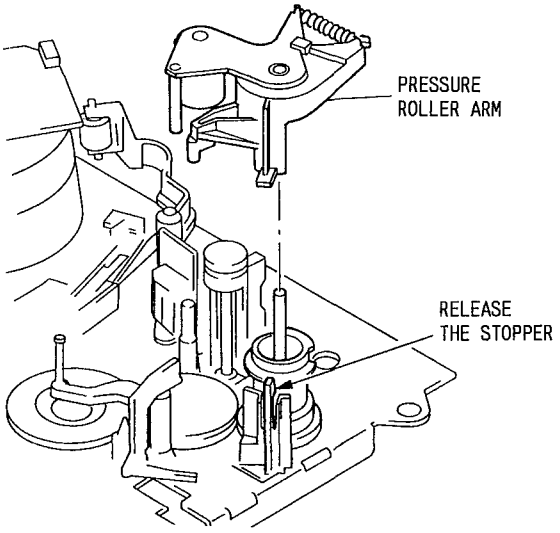


Fig. 3-9

3-10. Spiral gear and P. out arm

◆ Cautions when reinstalling

1) Align the gear positions of the spiral gear and PR idler gear.
2) Clean the surface of the P. out arm with which the tape comes into contact.
3) Check that the P. out arm is set to the specified position.
4) Turn the lid opener counterclockwise to lock it.

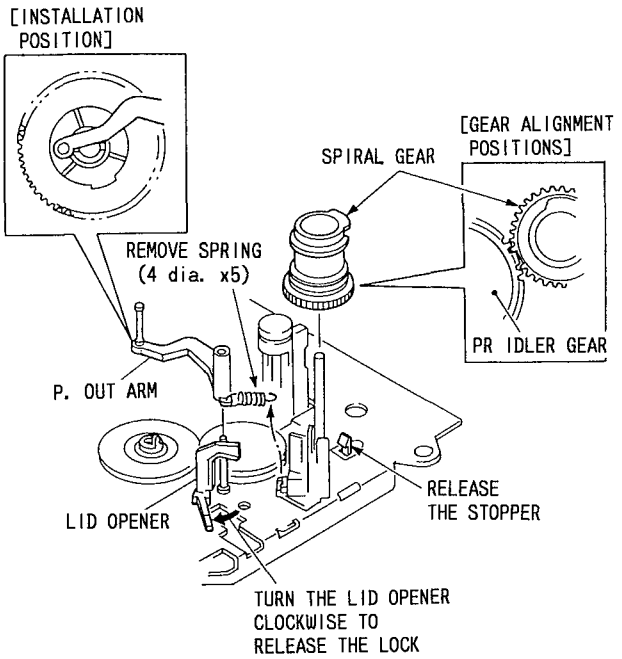


Fig. 3-10

3-11. PR idler gear

◆ Caution when reinstalling

1) Align the gear positions of the P. drive gear and PR idler gear.

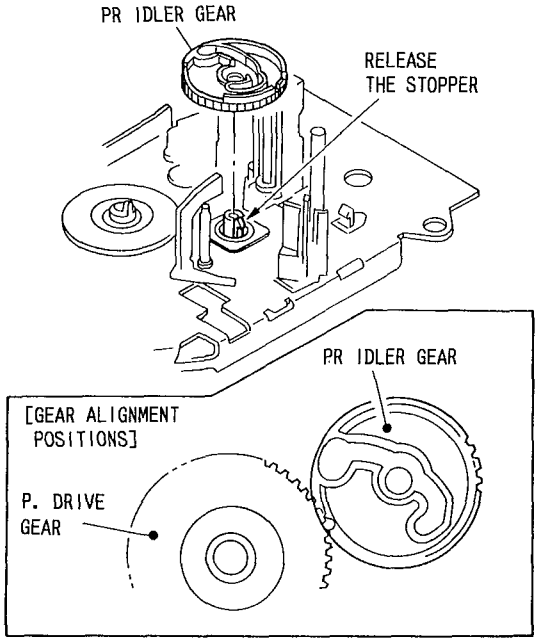


Fig. 3-11

3-12. FS brake and P. drive gear

◆ Caution when reinstalling

1) Align the positions of the P. drive gear and slider.

【Items to be checked around the pressure roller】

(A) Engaged section between the spiral gear and PR idler gear

(B) △ mark (No. 1) on the P. drive gear and ▽ mark on the spring hook

(C) Engaged section between the PR idler gear and P. drive gear

(D) The lid opener is locked in the specified position.

(E) Engaged section between the P. drive gear and slider

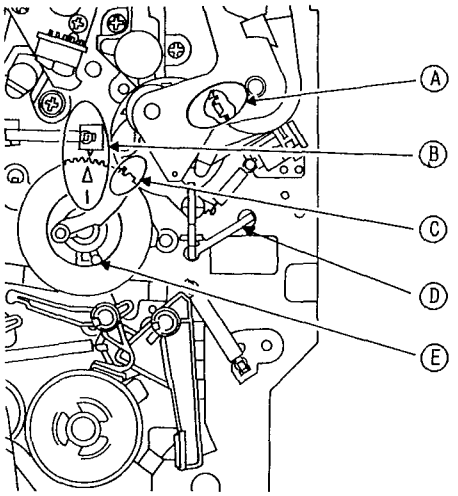


Fig. 3-12

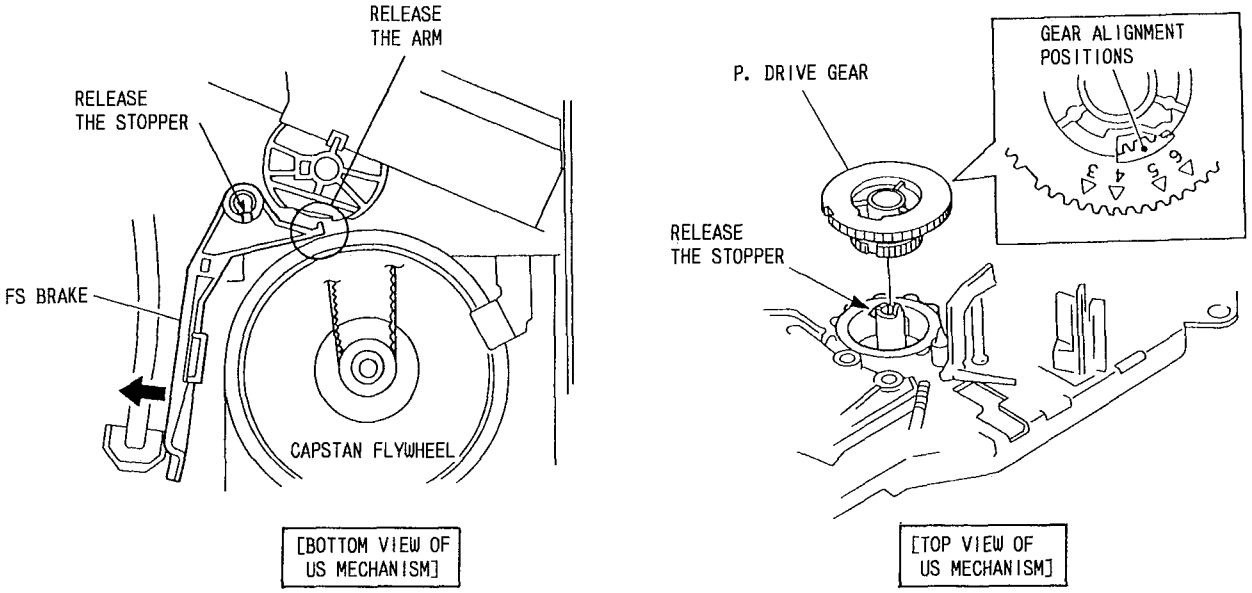


Fig. 3-13

3-13. Brake (R), Take-up brake, take-up reel disk and FR arm

◆ Mechanism adjustment after reinstalling

1) Reel disk height adjustment

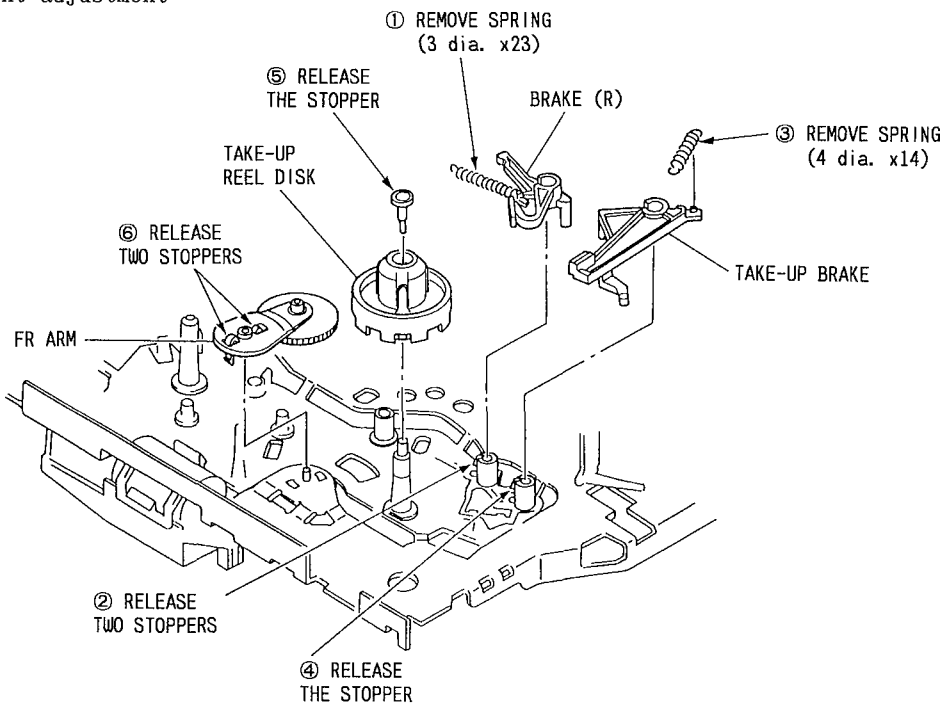


Fig. 3-14

3-14. Safety arm

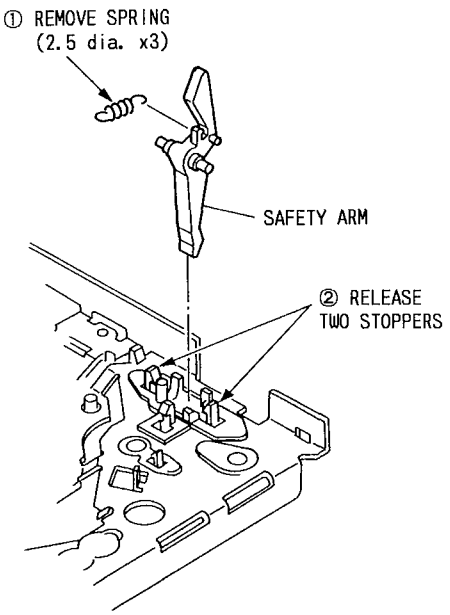


Fig. 3-15

3-15. Cam gear and LM wheel gear

◆ Caution when reinstalling

1) Align the positions of the cam gear and slider.

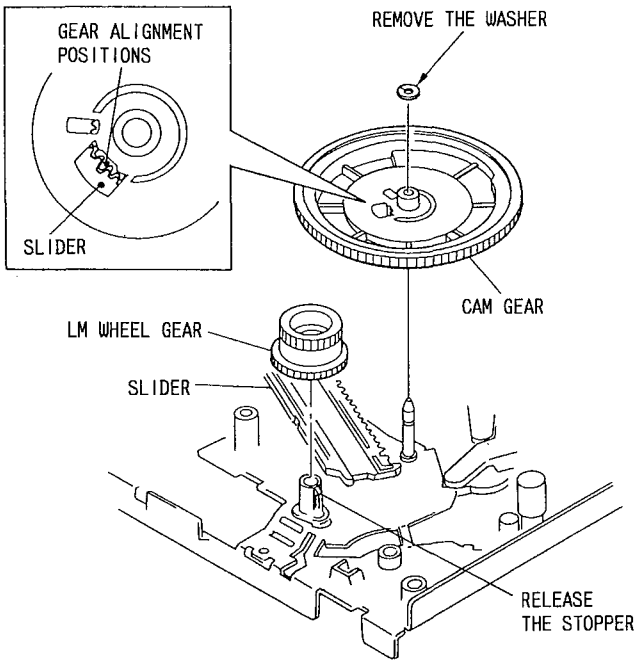


Fig. 3-16

3-16. Loading gears (R) and (L)

◆ Caution when reinstalling

1) Align the positions of loading gears (R) and (L).

【Items to check concerning gear alignment around loading gears】

(A) Engaged section between loading gears (R) and (L)

(B) Engaged section between the cam gear and slider

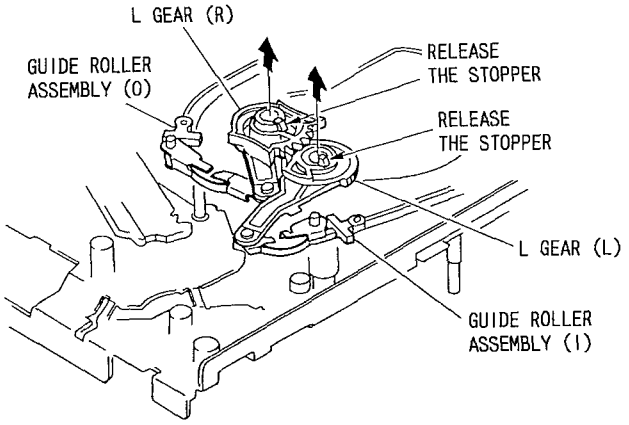


Fig. 3-17

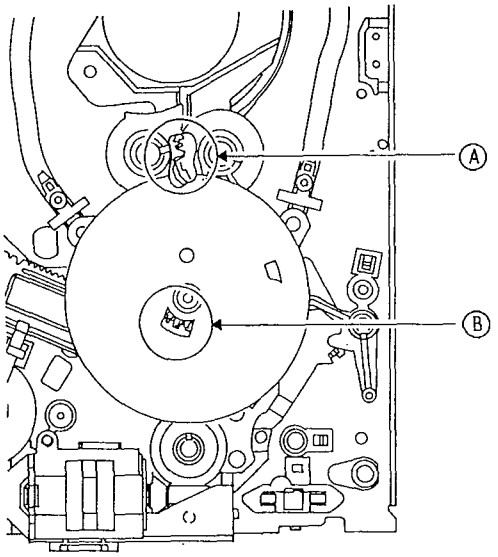


Fig. 3-18

3-17. Pulley assembly, drive belt, torque change arm, torque change gear, FR drive gear and transmission gear

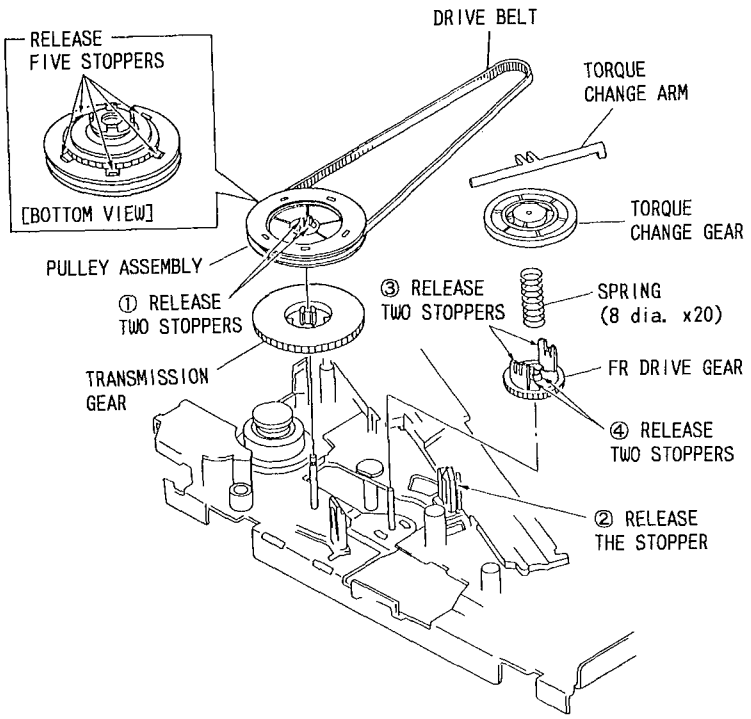


Fig. 3-19

3-18. FL idler gear and FL change gear

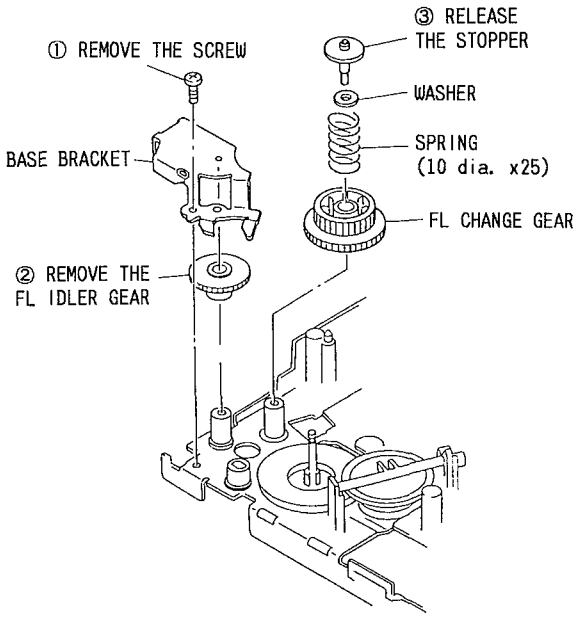


Fig. 3-20

3-19. Slider

◆ Tips when reinstalling

1) Align the projection at the left of the slider and the boss of the chassis.
2) Pull the take-up brake in the direction of the arrow and reinstall the slider.

[TIP FOR INSTALLATION (1)]

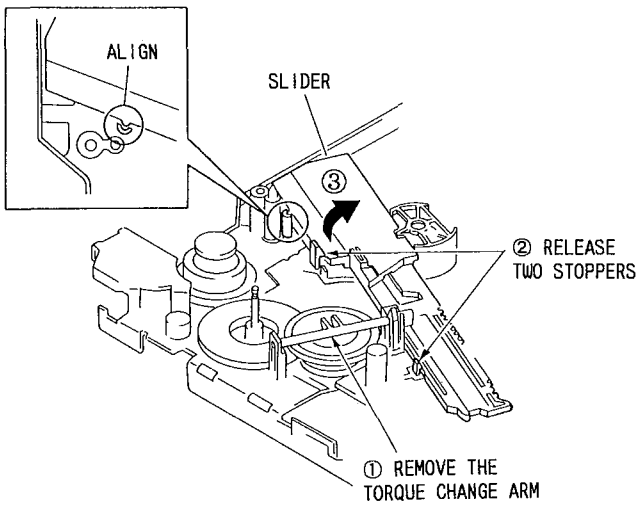


Fig. 3-21

[TIP FOR INSTALLATION (2)]

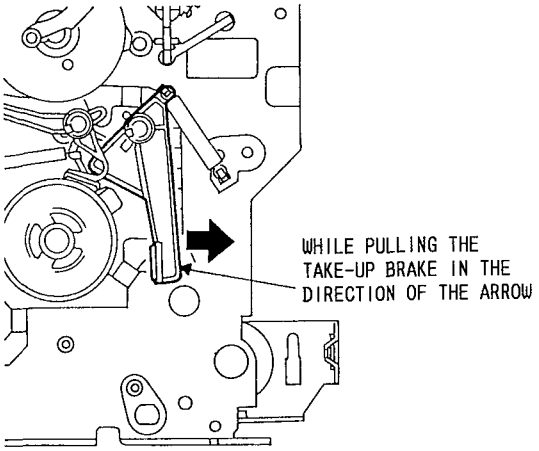


Fig. 3-22

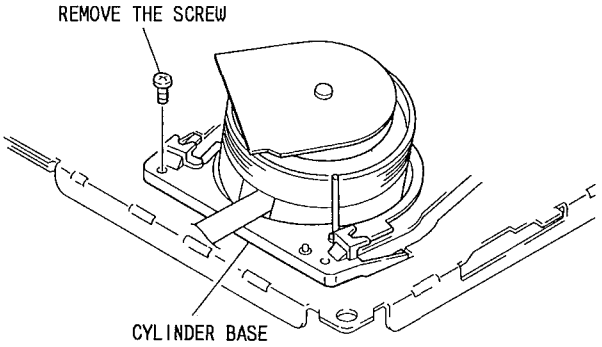
3-20. Cylinder base and guide roller assemblies

◆ Caution when reinstalling

1) Clean the surfaces of the guide rollers with which the tape comes into contact.

◆ Mechanism adjustment after reinstalling

1) Guide roller height adjustment



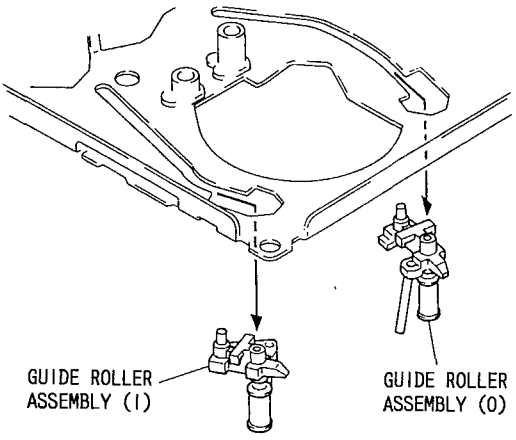


Fig. 3-23

Item to Check After Reinstalling the US Mechanism

After dismantling the mechanism or replacing its components, reinstall the components in their original positions correctly and perform the following checks.

Checking the surface of US mechanism

(A) The HC mechanism is set in the correct position.
(B) The engaged section between the spiral gear and PR idler gear is correct.
(C) The engaged section between the PR idler gear and P. drive gear is correct.
(D) The P. out arm is set to the correct position.
(E) The engaged section between the P. drive gear and slider is correct.

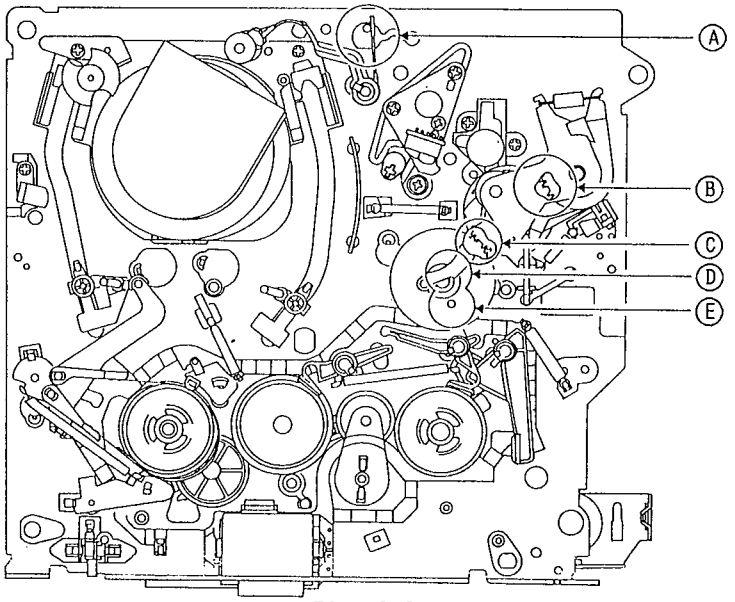


Fig. 3-24

Checking the bottom of US mechanism

(A) The projection of the slider and the boss of chassis are aligned.
(B) The engaged section between the loading gears (R) and (L) is correct.
(C) The sections in which the cam gear and slider are engaged are correct.

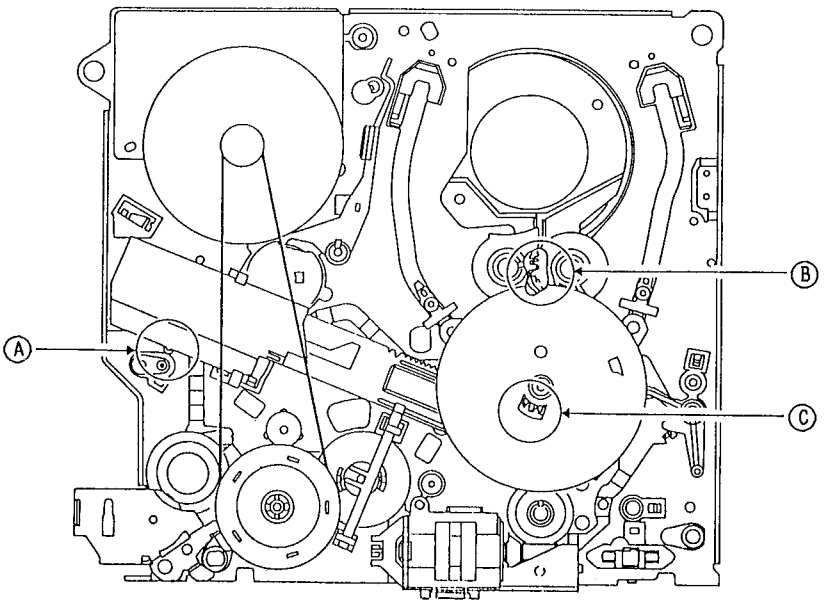
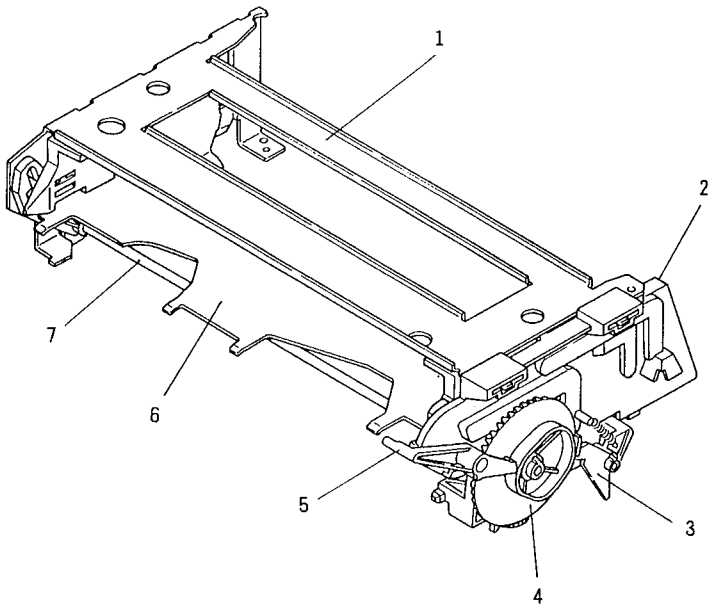


Fig. 3-25

4. Identifications and Locations of Parts in US-FL Mechanism



1. Side bracket (L)
2. Side bracket (R)
3. Switch arm
4. Bevel gear
5. Door arm
6. Cassette holder
7. FL drive arm

Fig. 4-1

5. Procedure to Dismantle the US-FL Mechanism

5-1. Door arm, switch arm, bevel gear and FL gear

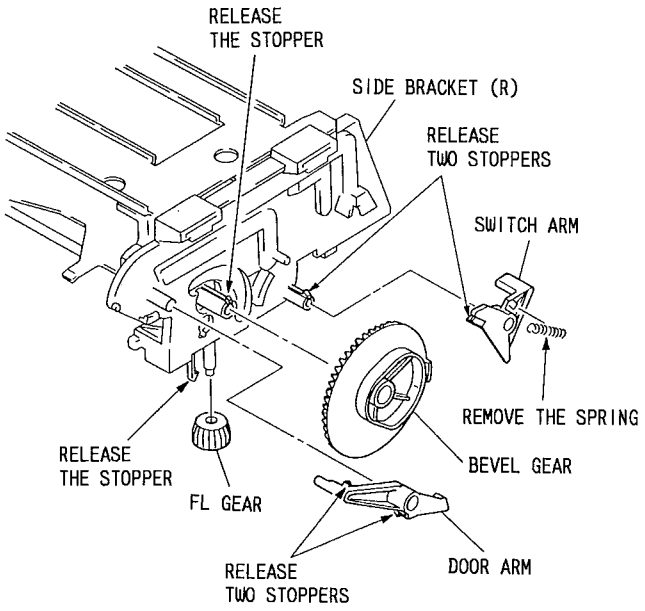


Fig. 5-1

◆ Caution when reinstalling

1) Reinstall the bevel gear so the holders in the bevel gear and side bracket (R) are aligned.

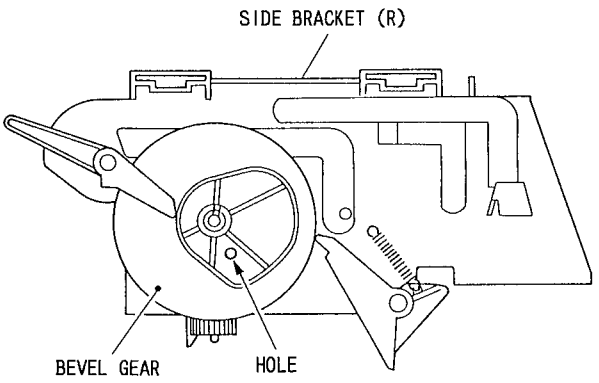


Fig. 5-2

5-2. Side brackets (R) and (L), cassette holder and FL drive arm

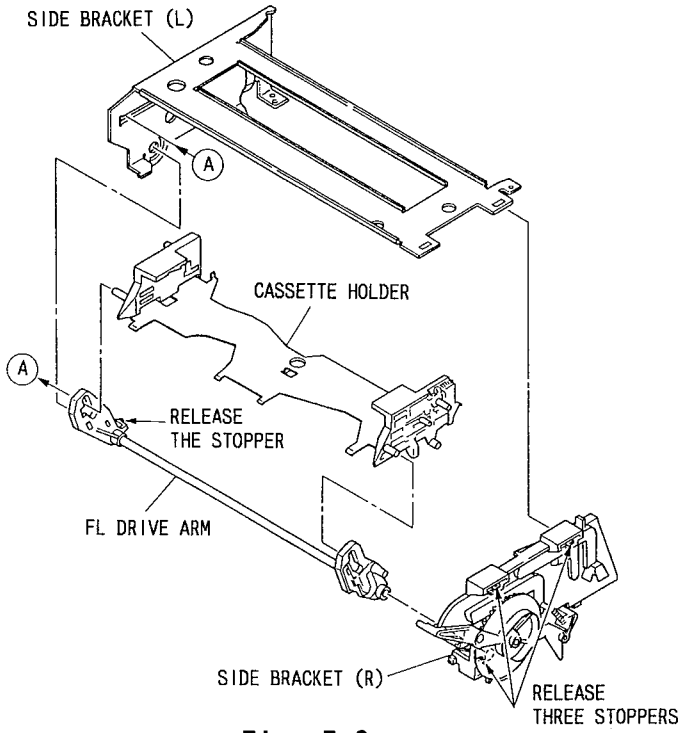


Fig. 5-3

◆ Cautions when reinstalling

1) Check the insertion of seven bosses.
2) Align hole (a) in side bracket (R) and the hole in the bevel gear.

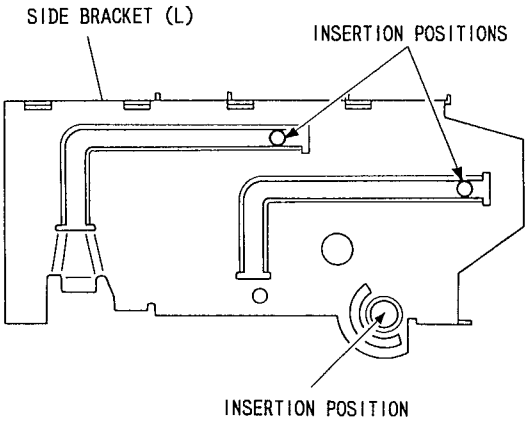


Fig. 5-4

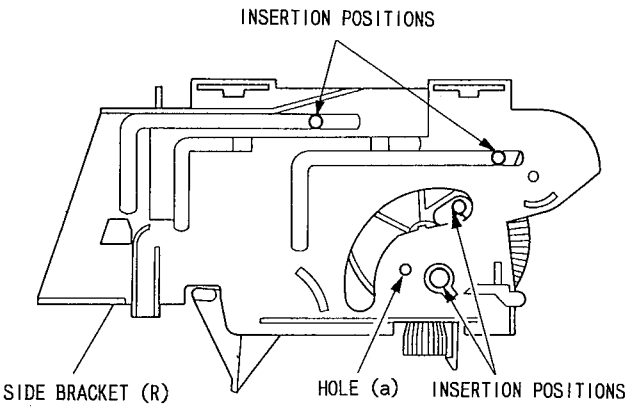
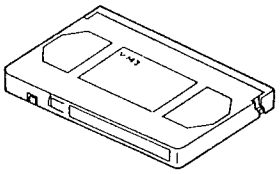
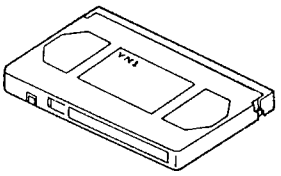
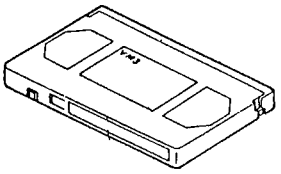
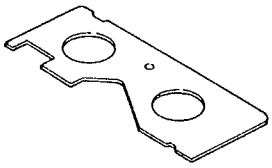
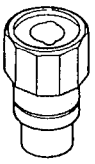
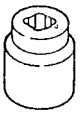
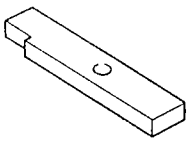
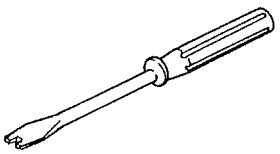


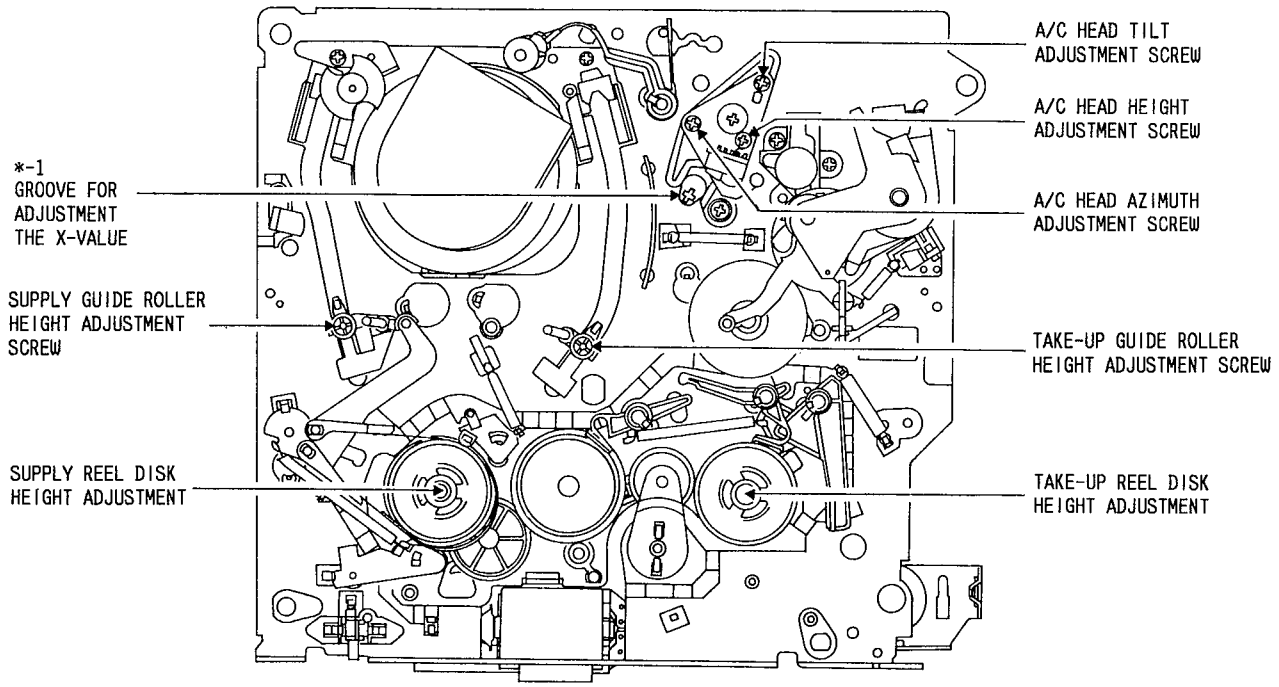
Fig. 5-5

CHAPTER 3 MECHANICAL ADJUSTMENT

1. List of Adjustment Jigs

1. NTSC Alignment Tape [For NTSC] Part No.7099046 	2. 30HMP2-1 Alignment Tape [For NTSC] Part No.7099089 	3. PAL Alignment Tape [For PAL] Part No.7099052 
4. Master Plane Part No.7099279 	5. Torque Gauge Part No.7099039 	6. Torque Gauge Adapter Part No.7099035 
7. Reel Disk Height Jig Part No.7099038 	8. Guide Roller Adjustment Screwdriver Part No.7069064 	

2. Diagram showing Adjustment Locations


A/C HEAD TILT ADJUSTMENT SCREW
A/C HEAD HEIGHT ADJUSTMENT SCREW
*-1 GROOVE FOR ADJUSTMENT THE X-VALUE
A/C HEAD AZIMUTH ADJUSTMENT SCREW
SUPPLY GUIDE ROLLER HEIGHT ADJUSTMENT SCREW
TAKE-UP GUIDE ROLLER HEIGHT ADJUSTMENT SCREW
SUPPLY REEL DISK HEIGHT ADJUSTMENT
TAKE-UP REEL DISK HEIGHT ADJUSTMENT

*-1: For X-value adjustment, refer to the chapter on electrical adjustment in the service manual of each model.

3. Tape Transport Component Adjustments

The tape transport system is a generic term for the path from the supply reel disk to the take-up reel disk via the cylinder (video heads). The tape transport components, especially the components which come into direct contact with the tape, must be kept clean without damage, dust, oil. etc. adhering to the contact surfaces.
When replacing components in the tape transport system, adjust only the new components so the transport system is stabilized.

3-1. Reel disk height adjustment

Purpose: To set the height of reels in the cassette to the specified value so the tape height is determined.

Test equipment/jig	Preparation for Adjustment	State of VCR	Adjustment points
· Master plane (Parts No.7099279) · Reel disk height jig (Parts No.7099038)	1) Remove the cassette loading mechanism. 2) Mount the master plane and place the reel disk height jig on it.	———	· Washers in the supply and take-up reel disks

Adjustment procedure

1) Check that the reel disk is placed between sections A and B of the reel disk height jig.
2) If the above cannot be confirmed, replace the washers (0.5 mm thick) of the reel disk or adjust the number of washers.

[Procedure to replace supply reel disk washers]

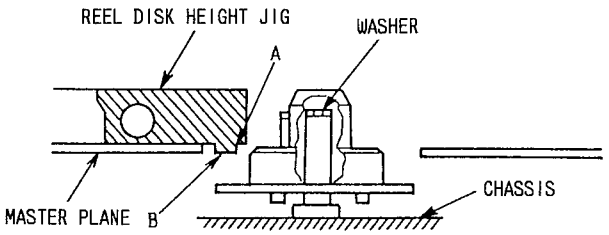
1) Remove the tension arm and tension band.
2) Remove the supply subbrake.
3) Lift the supply reel disk and replace the washers or adjust the number of washers.

[Procedure to replace take-up reel disk washers]

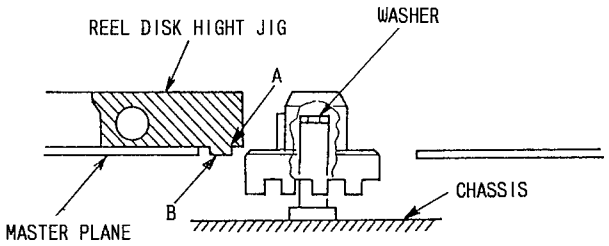
1) Remove brake (R).
2) Lift the take-up reel disk and replace the washers or adjust the number of washers.

Adjustment diagram

[SUPPLY REEL DISK]



[TAKE-UP REEL DISK]



3-2. Tension pole position check

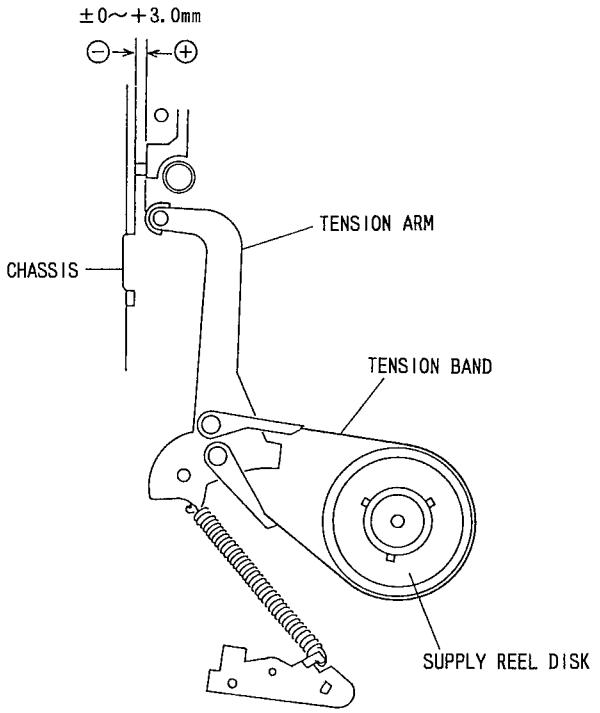
Purpose: To keep the tension of the tape to be supplied constant so the contact between the heads and tape is stabilized.

Test equipment/jig	Preparation for Adjustment	State of VCR	Adjustment points
———	———	1) Remove the top cover. 2) Set the VCR to the loading state without inserting a cassette. (See page 4-1)	———

Checking procedure

1) Check that the gap between the tension arm and the end of the chassis is ±0 - +3.0 mm.
2) If the tension pole position drifts greatly after checking, replace the tension band.

Checking diagram



3-3. Guide roller height adjustment

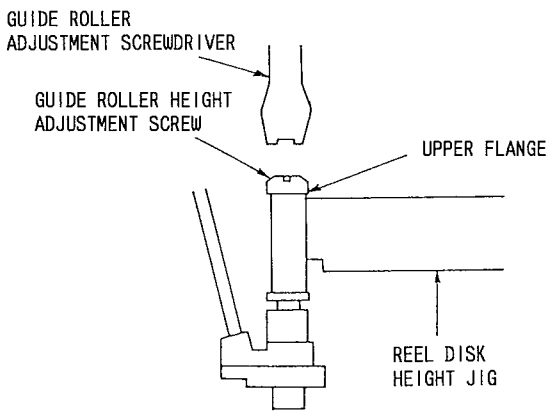
Purpose: To regulate the height of the tape so the bottom of tape runs along the tape guideline on the cylinder.

Coarse adjustment

Test equipment/jig	Preparation for Adjustment	State of VCR	Adjustment points
• Master plane (Part No.7099279) • Reel disk height jig (Part No.7099038) • Adjustment screwdriver (Part No.7069064)	1) Remove the cassette loading mechanism. 2) Mount the master plane and place the reel disk height jig on it.	———	Height adjustment screws on the supply and take-up guide rollers

Adjustment procedure
1) Turn the height adjustment screw so the upper flange of the guide roller and the top surface of the reel disk height jig are aligned.
2) Continue the precise adjustment.

Adjustment diagram

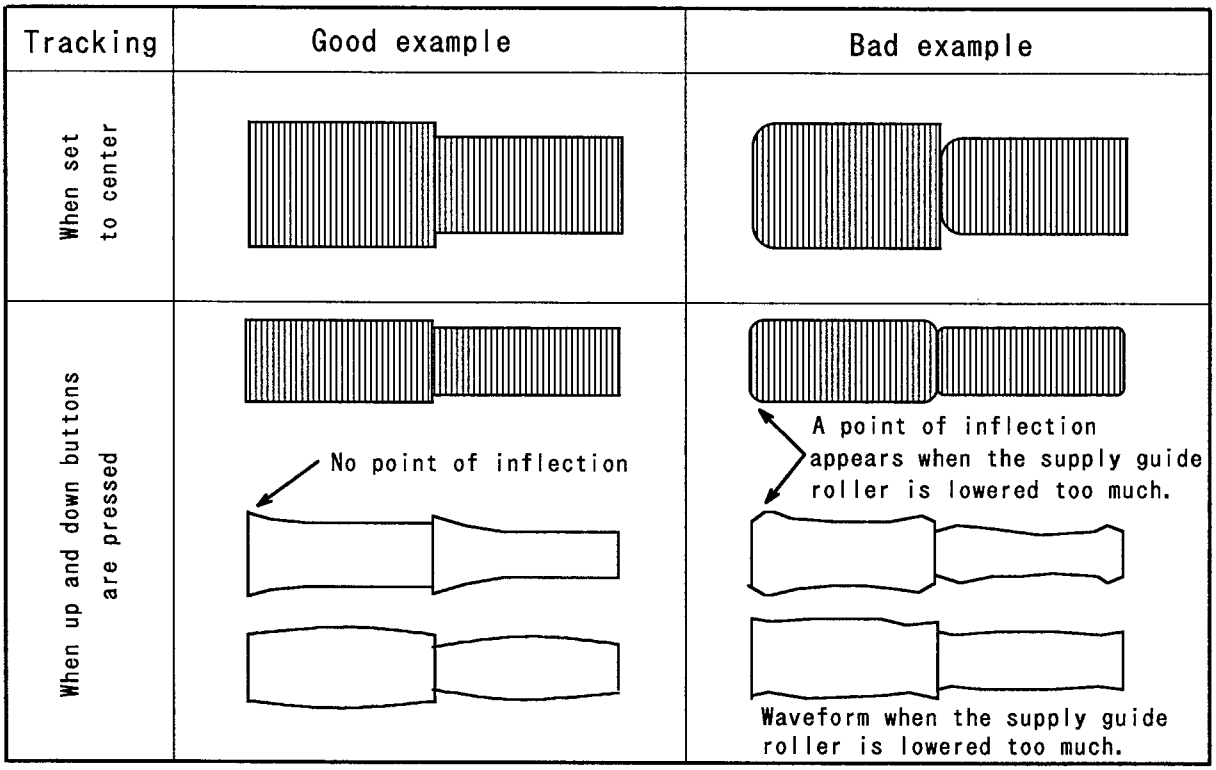


Precise adjustment

Test equipment/jig	Test equipment connection points	State of VCR	Adjustment points
• Oscilloscope	• CH-1: PB FM • CH-2: SW25Hz or 30Hz	• Play alignment tape (Color bars section)	• Guide roller height adjustment screws
• Alignment tape	———		

Adjustment procedure
1) Set the VCR to the X-value adjustment test mode.
2) Play the alignment tape and press the tracking up and down buttons simultaneously to set the tracking to the center.
(When performing this adjustment after replacing the cylinder, set the tracking so the FM output is maximum.)
3) Turn the height adjustment screw little by little so the FM output waveform is flat.
4) Press the tracking up and down buttons and fine adjust the height adjustment screw so the drop in the figure.
5) Release the test mode.

Waveforms


Tracking
Good example
Bad example
When set to center
When up and down buttons are pressed
No point of inflection
A point of inflection appears when the supply guide roller is lowered too much.
Waveform when the supply guide roller is lowered too much.

3-4. Audio/control (A/C) head adjustment

Purpose:	To keep the contact between the tape and head constant so the specified track can be recorded and played back.

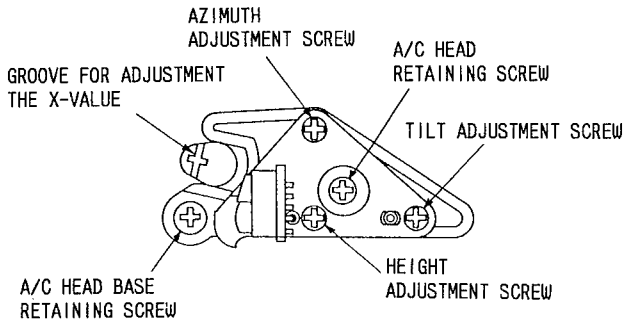
Since the height of A/C head (service part) is adjusted when the VCR leaves the factory, do not turn the height adjustment screw, tilt adjustment screw or azimuth adjustment screw unnecessarily.

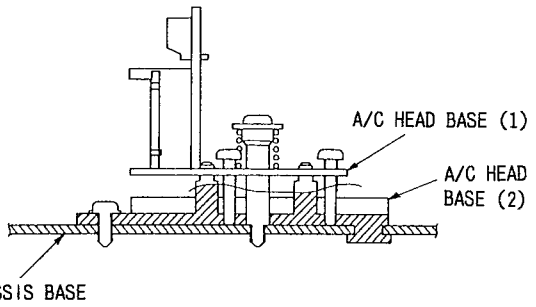
Rough adjustment

Test equipment/jig	Preparation for Adjustment	State of VCR	Adjustment points
• Blank tape	———	• Run the blank tape.	• Azimuth adjustment screw • Height adjustment screw • Tilt adjustment screw

Adjustment procedure/adjustment diagrams

1) Load a blank tape and set the VCR to the playback mode.
2) Check that there is no conspicuous curling or riding over of the tape around the A/C head. If conspicuous curling or riding over, etc. occurs, adjust the tilt adjustment screw and azimuth adjustment screw.

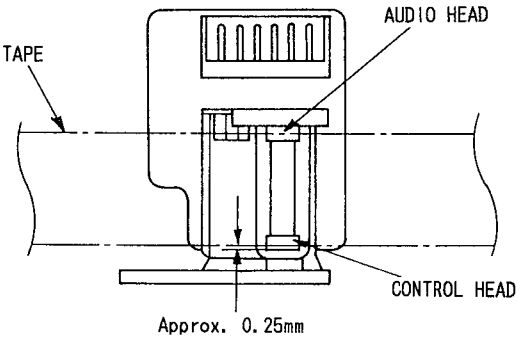




When adjusting the height of the A/C head

Set the VCR to the playback mode. If the height of the A/C head drifts greatly, adjust it by the following procedure.

1) Adjust the height so the tape's bottom edge is approximately 0.25mm above the bottom edge of the control head core.
2) Check that there is no conspicuous curling or riding over of the tape around the A/C head.
3) Continue the precise adjustment.



Precise adjustment

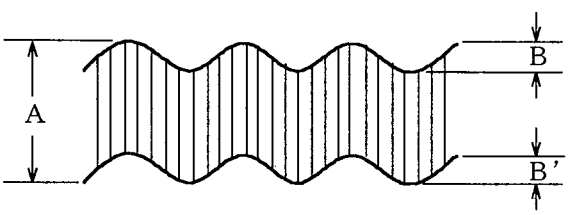
Test equipment/jig	Test equipment connection point	State of VCR	Adjustment points
• Oscilloscope • Alignment tape	• AUDIO output jack ———	• Play alignment tape (Stairsteps section)	• Azimuth adjustment screw • Tilt adjustment screw • Height adjustment screw

Adjustment procedure

1) Adjust the azimuth adjustment screw and tilt adjustment screw alternately little by little so the audio output is maximum and flat (with minimum fluctuations).

Supplement: When the A/C head height has been adjusted, also adjust the height adjustment screw alternately with the azimuth and tilt adjustment screws.

Waveform diagram



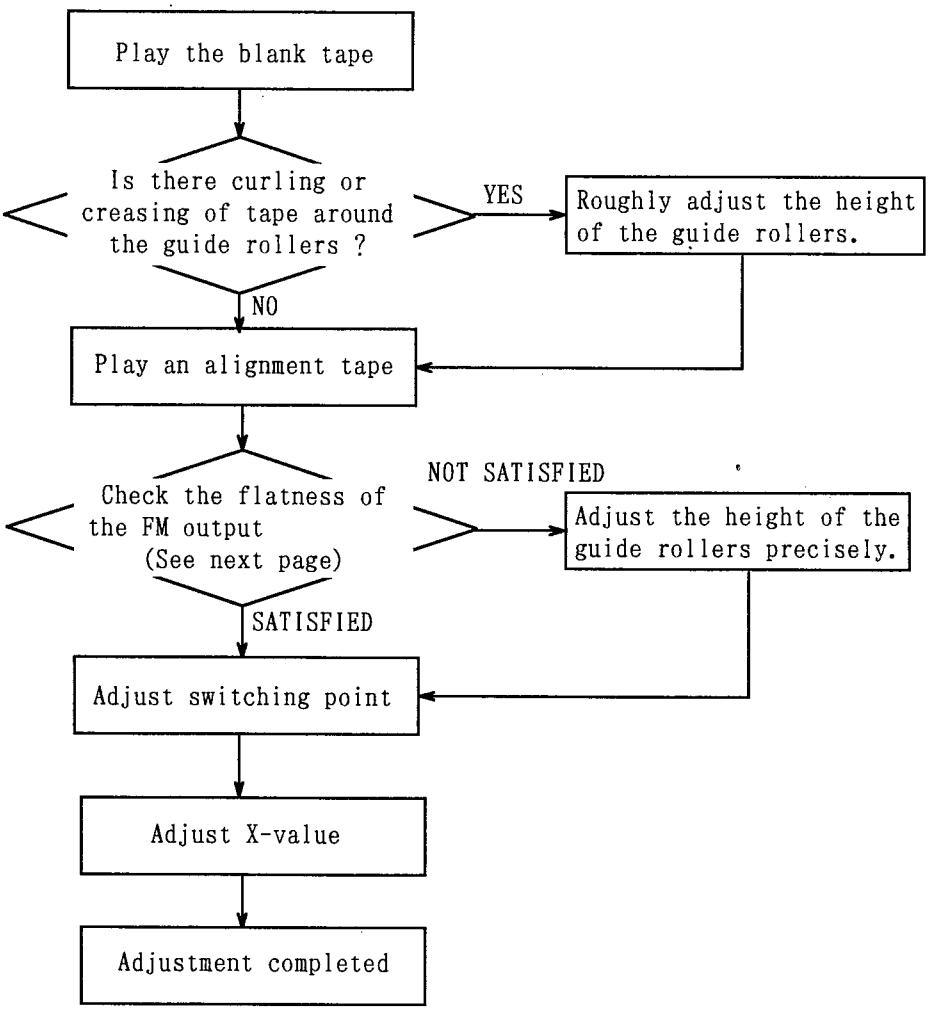
A: Maximum B B': Minimum

3-5. Adjustments after replacing the cylinder

Purpose: To eliminate drift in the relative height with the guide rollers, the X-value, etc. However, this drift is very small when the cylinder has been replaced correctly.

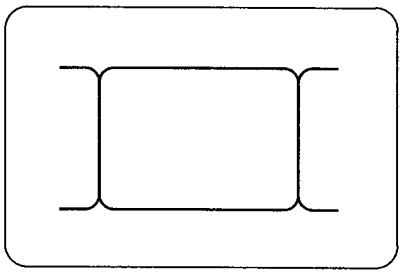
Test equipment/jig	Test equipment connection points	State of VCR	Adjustment points
• Oscilloscope	• CH-1: PB FM • CH-2: SW25Hz or 30Hz	• Run the blank tape	• Guide rollers (precise adjustment on page 3-4) 〔Electrical adjustment〕 • Head switching point • X-value
• Alignment tape	———	• Play alignment tape (Stairsteps section)	
• Blank tape	———		

Adjustment procedure

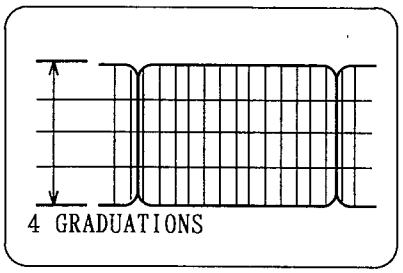

Play the blank tape
Is there curling or creasing of tape around the guide rollers ?
YES
Roughly adjust the height of the guide rollers.
NO
Play an alignment tape
Check the flatness of the FM output (See next page)
NOT SATISFIED
Adjust the height of the guide rollers precisely.
SATISFIED
Adjust switching point
Adjust X-value
Adjustment completed

Checking the flatness and fluctuations of FM output / waveform diagrams

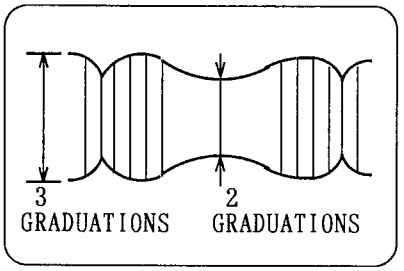
1) Activate autotracking.



2) Finely adjust the voltage level range of the oscilloscope so the FM output is set to 4 graduations.



3) Adjust the tracking so the maximum amplitude of the FM output is set to 3 graduations.
4) Check that the minimum amplitude is more than 2 graduations at this time.



5) Check that the difference between the maximum and minimum level fluctuations is less than 13%.

3-6. Tension/Torque Checks

Purpose: It is necessary to check the tension, torque, compression strength at the tape take-up and moving sections to smooth the running of tape and satisfy the basic performanceof the VCR. Perform this check if the running of tape is not smooth or the tape speed is abnormal.

Test equipment/jigs	State of VCR
• Torque gauge • Torque gauge adapter	• Set the VCR to each operation mode without inserting a cassette. (See page 4-1)

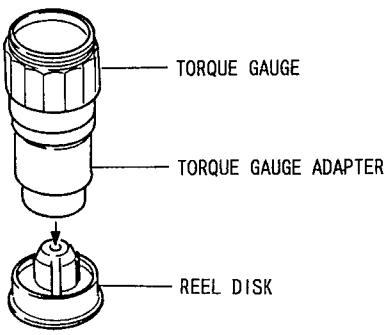
Item	VCR operation mode	Measured reel	Measured value
Main brake torque	Stop (Note)	Supply & take-up reels	100 ~ 300 g·cm
Slack removal torque	Unloading	Supply reel	95 ~ 180 g·cm
Fast forward torque	Fast forward	Take-up reel	400 g·cm or more
Rewind torque	Rewind	Supply reel	400 g·cm or more
Take-up torque	Playback	Take-up reel	45 ~ 75 g·cm
Back-tension torque	Fast forward/Rewind	Supply & take-up reels	5 ~ 20 g·cm
Playback back-tension torque	Playback	Supply reel	25 ~ 36 g·cm
Reverse search torque	Reverse search	Supply reel	95 ~ 250 g·cm
Reverse play torque	Reverse play	Supply reel	95 ~ 150 g·cm
Slow torque	Slow	Take-up reel	30 ~ 75 g·cm
Take-up brake torque	Reverse search	Take-up reel	65 ~ 100 g·cm

Checking procedure

Mount the torque gauge and torque gauge adapter and hold the torque gauge with your fingers for measurement.

Note : Measure in the loading stop-2 state. (See next page.)

Adjustment diagram



CHAPTER 4 MECHANISM OPERATION CHECK AND MAINTENANCE/INSPECTION

Mechanism Operation Check

Check the mechanism operation after dismantling and adjusting the mechanical block.
Check the operation after setting the mechanism to the loading state without loading a cassette.
If the mechanism does not operate normally, recheck the components and sections related to the area of the abnormality.

1. Method to set the VCR to the loading state without loading a cassette

Unplug the power cord from the AC outlet.

↓

Remove the top cover and front panel.

↓

Remove the US front loading (FL) mechanism.

↓

Cover the end sensors (sections A in the figure on the right) with black masking tape, etc. to shut off light.

↓

Plug the power cord into an AC outlet again and turn the VCR on.

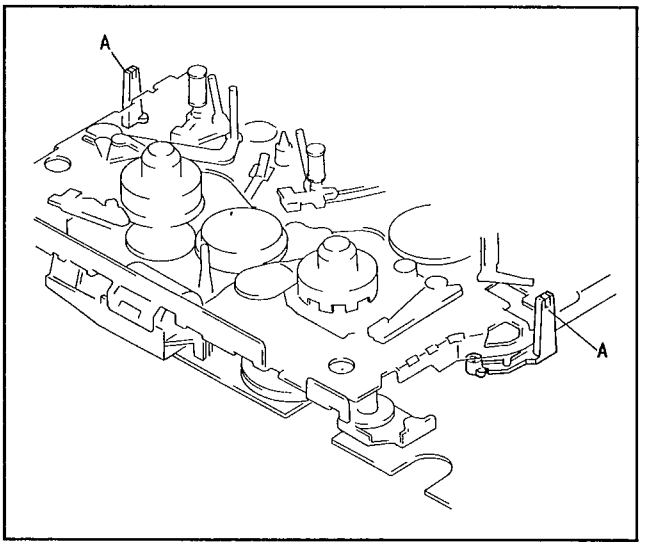
↓

The cylinder rotates and the guide rollers are set to the loading state.
The VCR stands by in the LOADING-STOP 1 mode (mode switch position: 6). *-1

→ Proceed to the operation check on the next page.

↓

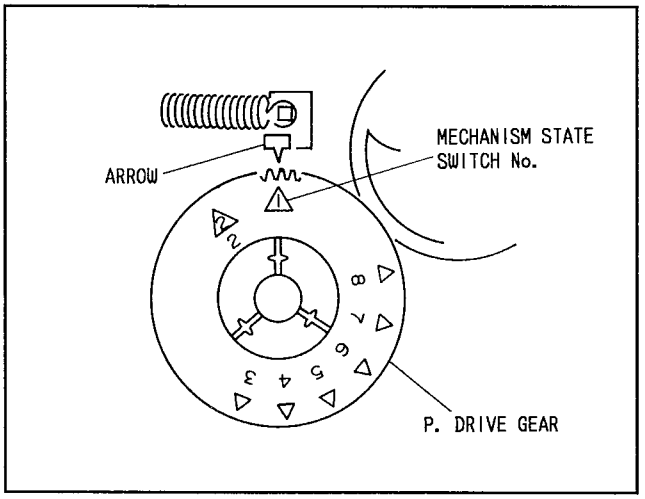
When the stop mode continues for one minute, the pressure roller and tension arm will no longer be pressed. The VCR enters the LOADING-STOP 2 mode (mode switch position:7). After five more minutes, the cylinder is stopped.



*-1: The VCR can accept the inputs of each mode in this state. However, rewinding can be done for no more than several seconds and the power is shut off because the take-up reel disk is in the stop state and reel pulses cannot be detected. Turn the take-up reel disk manually for rewind operation.

[Method to check the position of the mechanism mode switch]

Check the mode position by observing the arrow on the spring hook which is positioned in front of the A/C head and the arrow no. on the P. drive gear.



2. Checking the operation in each mode

Operation in each mode	Mode switch position
LOADING-STOP 1 mode	6

Recording/playback modes

Press the record or playback button of the VCR. The take-up reel disk starts to turn.	6
Press the stop button of the VCR. The take-up reek disk stops.	6

* To set to the record mode, pull the safety arm forward.

Still play mode

Press the playback button of the VCR. The take-up reel disk starts to turn.	6
Press the pause button. Take-up reel disk and capstan stop.	5
Press the stop button. The take-up reel disk and capstan turn forward and then stop.	6

Record pause mode

Press the record button of the VCR. The tension arm is released and the supply reel disk turns in reverse.	3
The tension arm is pressed and the take-up reel disk and capstan shaft to turn forward.	6
Press the pause button. The tension arm is released and the supply reel disk turns in reverse, then the take-up reel disk and capstan shaft turn forward. When the start of a program is located, the VCR enters the pause mode.	3 ↓ 5

Rewind mode

Press the rewind button. The tension arm is released and the T-brake is applied.	6 ↓ 3
The reel disk starts to turn.	3
Press the stop button. The T-brake is released and the tension arm is pressed.	6

After completing the check, be sure to reset the VCR to the original state by the following procedure.

1) Turn the VCR off.
2) Remove the masking tape, etc. from the supply and take-up end sensors.
3) Unplug the power cord from the AC outlet to reset the microprocessor(s).
4) Install the cassette loading mechanism to complete the work.

Maintenance/ Inspection Procedure

1. Necessity of Maintenance and Inspection

The recording density of a VCR is much higher than that of an audio recorder. A VCR uses very precise components to ensure compatibility with other VCRs. If any of mechanical components are worn or dirty, the symptoms will be the same as if the VCR has malfunctioned. To ensure a good picture, it is necessary to clean and lubricate the mechanism periodically and replace worn-out components.

2. Scheduled Maintenance and Inspection

Schedules for maintenance and inspection are not fixed because they vary greatly according to the way in which the customer uses the VCR and the environment in which the VCR is used. But, in general home use, a good picture is ensured if inspection and maintenance are done every 1,000 hours of use. Table 1 shows the relation between the time used and inspection period.

3. Before Determining that the VCR is Faulty

When a VCR has been used for over 1,000 hours, the symptoms shown in Table 2 may be seen in the playback picture. These faults may be remedied by cleaning and lubricating mechanical components. Check the hours for which the VCR has been used referring to Table 1. If you determine that the VCR is ready for inspection and maintenance, check the inspection locations shown in Table 2.

Caution: If the VCR cannot be restored to normal operation after cleaning components marked "○" in the part replacement column, they are degraded. Replace them.

Table 1

Average hours used per day	When inspection is necessary: 1 year	18 months	3 years
One hour			
Two hours			
Three hours			

Table 2

Symptom	Cause	Inspection location	Replacement
Color beats	Dirt on full erase (FE) head	Clean the surface of FE head which is in contact with tape	
Poor S/N, no color	Dirt on video heads (or they are degraded)	Clean video heads	○
Vertical jitter, horizontal jitter	Dirt on video heads and cylinder. Dirt in tape transport system.	Clean video heads and cylinder. Clean guide rollers and inclined guides.	
Low volume or sound distorted	Dirt on audio/control (A/C) head	Clean the surface of the A/C head which is in contact with tape	○
Tape is slack or does not run	Dirt on pressure roller	Clean pressure roller and capstan shaft	○

Inspection Locations

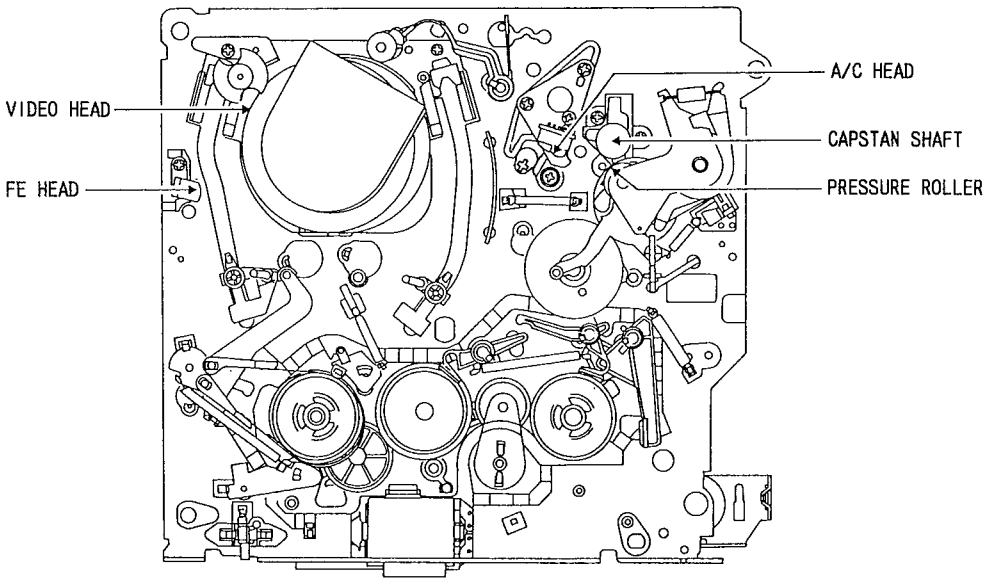


Fig. 1 Inspection Location Diagram

4. Tools Needed for Inspection and Maintenance

(1) Head cleaning kit (Fig. 2)
(2) Grease and oil for maintenance (Fig. 3)
(3) Alcohol
(4) Gauze

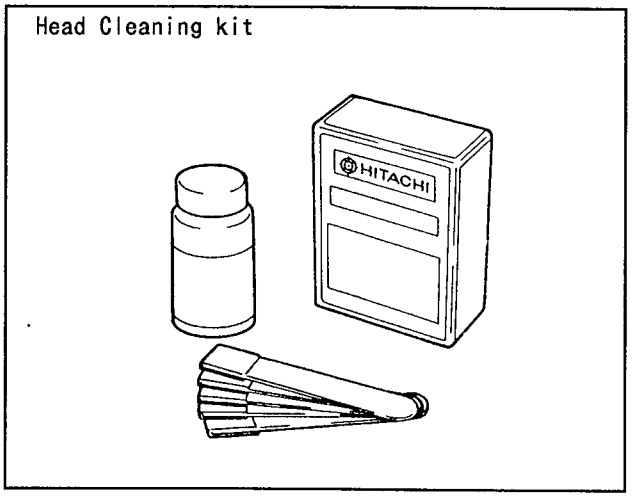


Fig. 2

Table 3 Locations for Use of Oil and Grease for Maintenance

Name	Lubricating or greasing location
Sonic Slidas Oil (#1600)	Lubricate low-speed rotating sections
Molicoat (PG-641)	Coat metal and mold sections under light load

5. Cleaning Procedure

1) Cleaning the video heads (Fig. 4)
First use a cleaning tape. If the dirt on the heads is too stubborn to be removed by the tape, use the head cleaning kit to clean the heads by the following procedure.
Moisten the cleaning stick with cleaning fluid and touch the head tip with the stick and gently turn the head (rotate the cylinder) to the left and right. (Do not move the stick vertically and be sure that only the chamois leather on the stick touches the head tips. Otherwise, the heads may be damaged.) After cleaning, thoroughly dry the heads, then run the tape. If cleaning fluid remains on the heads, the tape may be damaged when it comes into contact with the heads.
2) Cleaning the tape transport system (Fig. 3)
Moisten gauze with alcohol and use it to clean components ① - ⑬ (see "cleaning the video heads" for component ⑦).
Caution: When cleaning, take great care not to damage tape transport components or deform them by applying excessive force.

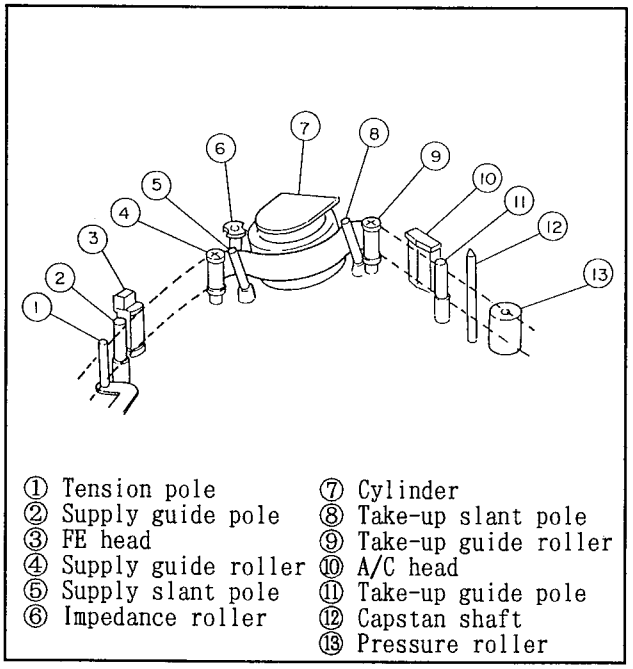


Fig. 3

6. Lubricating and Greasing

1) Lubricating guidelines
Use the oiler to apply one or two drop of Sonic Slidas oil. Make sure not to use too much oil because it may spill over and leak out, coming into contact with rotating parts and causing slippage or other problems. If too much oil is applied, wipe clean using gauze moistened with alcohol.
2) Greasing guidelines
Apply grease (Molicoat) with a stick or brush. Do not use too much grease. It may come into contact with the tape transport or drive system. Wipe off any excess and clean with gauze moistened with alcohol.
3) Oil or grease the specified locations referring to Table 4 on the next page.

[Cleaning method]

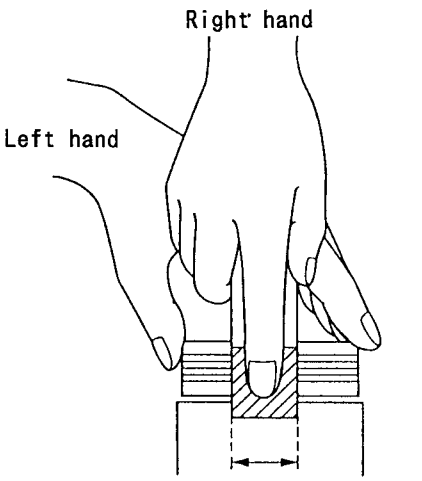


Fig. 4

7. Maintenance/Inspection Schedules of Mechanical Parts

Caution: This timetable shows the period when each component is required to be maintained and inspected. Use the following table as a reference as the maintenance/inspection period depends on how the unit is used and the environment in which it is used.
For components indicated as C/R, replace components if the VCR does not become normal after being cleaned.

Table-4

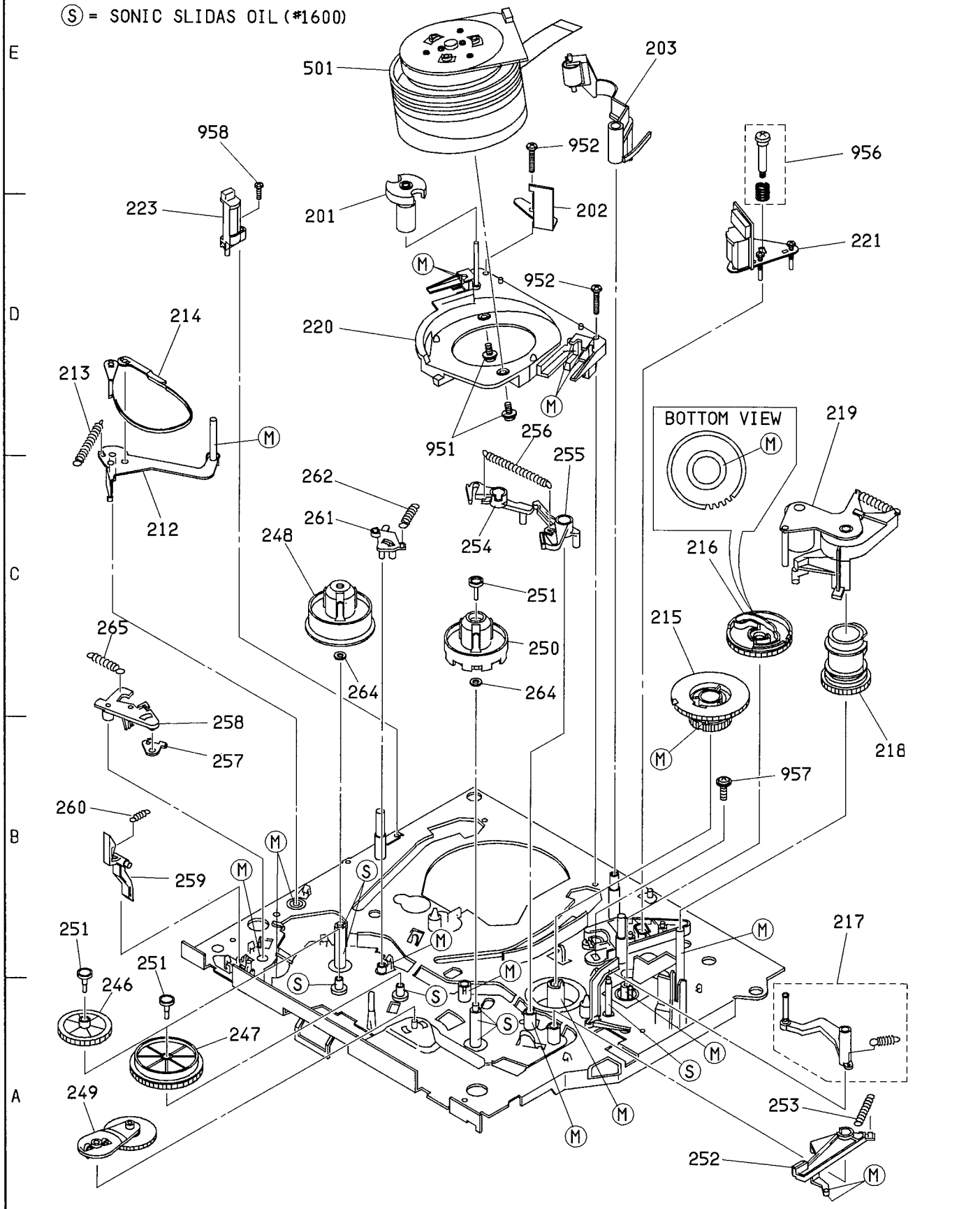
Component	hours				
	1000	2000	3000	4000	5000
Video heads (cylinder motor)	C／R	C／R	C／R	C／R	C／R
Audio/control (A/C) head	C	C／R	C	R	C
Full erase (FE) head	C	C	C	R	C
Supply guide roller	C	C	C／R	C	C
Take-up guide roller	C	C	C／R	C	C
Tension band		R		R	
Tension arm	C	C	C	C	C
Supply reel disk		C		C	
Take-up reel disk		C		C	
Pressure roller assembly	C	R	C	R	C
Drive belt		C		C	
Capstan motor	C	R	C	R	C
Loading motor				R	
Cylinder motor		R		R	
Mechanism state switch				(R)	
Idler gear 1		R		R	
Idler gear 2		R		R	
FR gear		R		R	
Supply slant pole	C	C	C	C	C
Take-up slant pole	C	C	C	C	C
Impedance roller	C	C	C	C	C
Guide pole	C	C	C	C	C
Tape guideline on cylinder	C	C	C	C	C
Brake (L)	C	C／R	C	C／R	C
Brake (R)	C	C／R	C	C／R	C
HC arm					(R)
Shaft and bearing of supply reel disk		S		S	
Shaft and bearing of take-up reel disk		S		S	
Shaft and bearing of idler gear 1		S		S	
Shaft and bearing of idler gear 2		S		S	
Shaft of pulley assembly		S		S	
Shafts of torque change gear and FR drive gear		S		S	
Shaft of pressure roller arm		M		M	
Guide roller base moving sections in chassis					M
Surface of contact between cylinder motor base and guide roller base during loading					M
Surface of contact between tension arm and supply guide roller base					M

R: Replacement of parts
C: Cleaning
S: Lubricating oil (Sonic Slidas oil)
M: Coating grease (Molicoat)

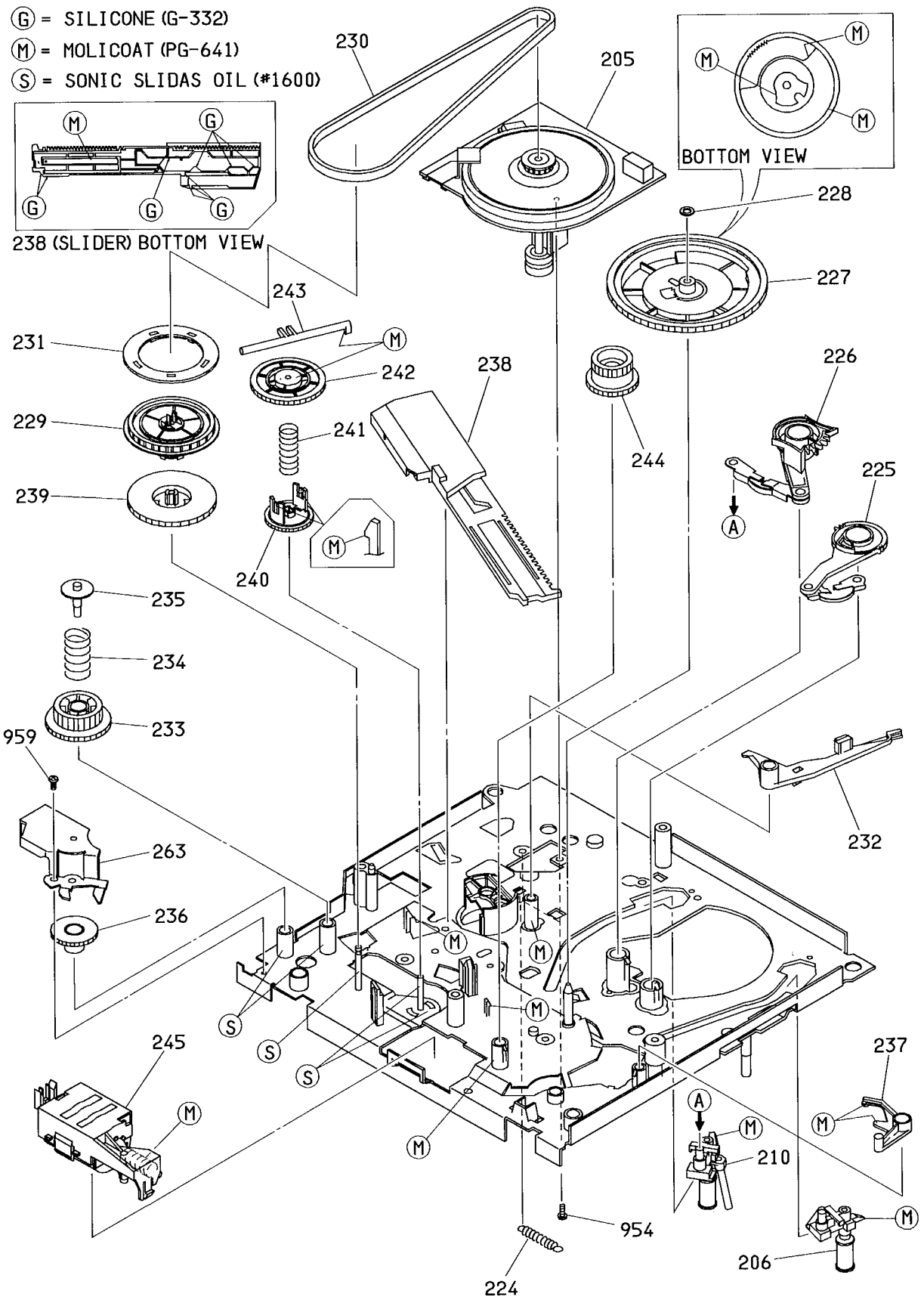
1. US-MECHANISM (TOP VIEW) SECTION

Ⓜ = MOLICOAT (PG-641)

Ⓢ = SONIC SLIDAS OIL (#1600)



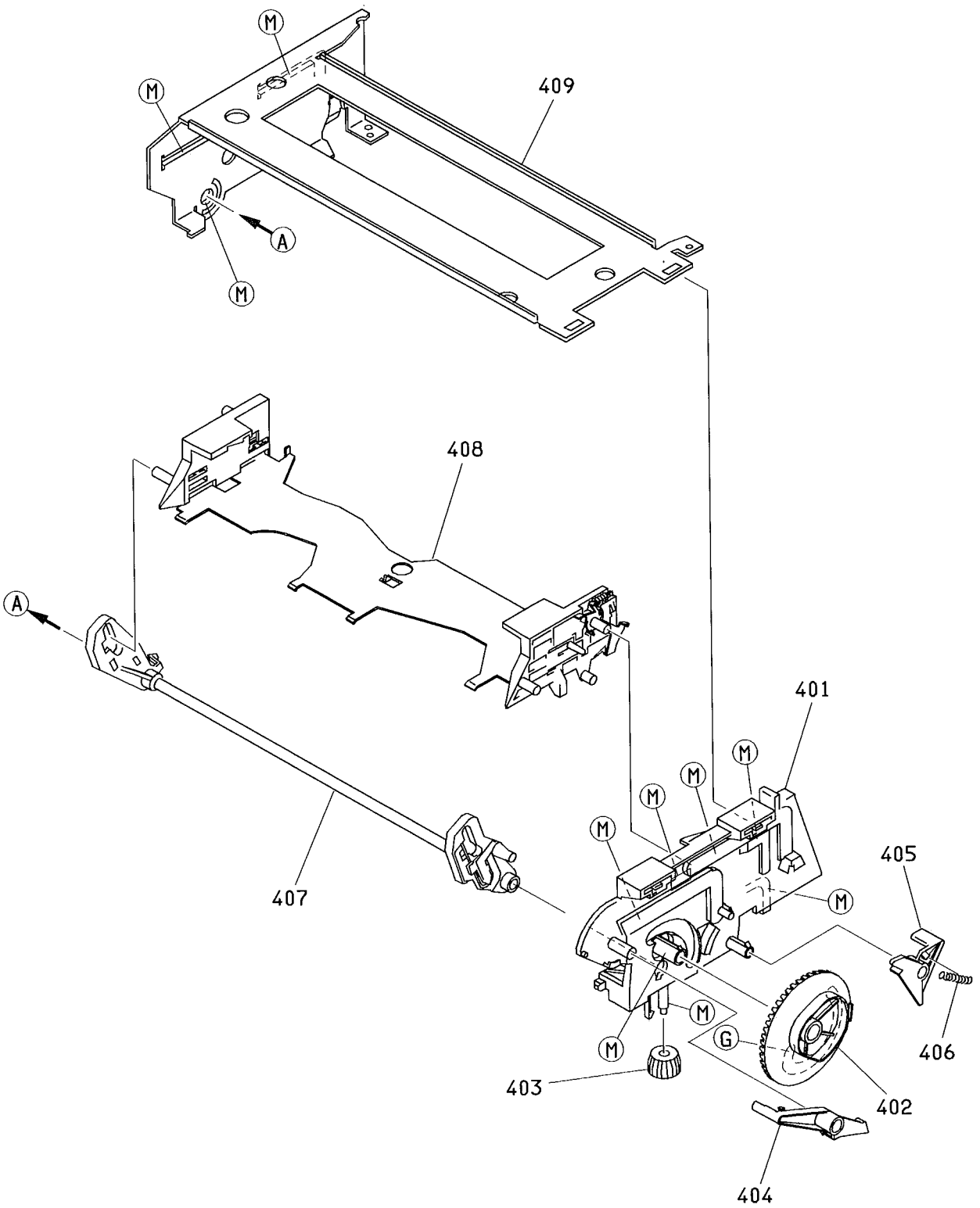
2. US-MECHANISM (BOTTOM VIEW) SECTION



3. US-FL MECHANISM SECTION

Ⓜ = MOLICOAT (PG-641)

Ⓖ = SILICONE (G-332)



Identifications of Components in US Mechanism

Index No.	Component
201	Impedance roller
202	Impedance plate
203	Head cleaning (HC) mechanism
204	FL mechanism assembly
205	Capstan motor
206	Guide roller base (I) assembly
210	Guide roller base (O) assembly
212	Tension arm
213	Spring
214	Tension band
215	P. drive gear
216	PR idler gear
217	P. out arm
218	Spiral gear
219	Pressure roller arm
220	Cylinder base
221	A/C head assembly
223	FE head
224	Spring
225	Loading gear (L)
226	Loading gear (R)
227	Cam gear
228	Poly-slider washer
229	Pulley assembly
230	Drive belt
231	Flange
232	FS brake
233	FL change gear
234	Spring
235	Spring hook
236	FL idler gear
237	Take-up operation arm
238	Slider
239	Transmission gear
240	FR drive gear
241	Spring
242	Torque change gear
243	Torque change arm
244	LM wheel gear
245	Loading motor assembly
246	Idler gear 1
247	Idler gear 2
248	Supply reel disk
249	FR arm
250	Take-up reel disk

Index No.	Component
251	Stopper
252	Take-up brake
253	Take-up brake spring
254	Brake (L)
255	Brake (R)
256	Spring
257	Jog gear
258	Jog arm
259	Safety arm
260	Spring
261	Supply subbrake
262	Spring
263	Base bracket
264	Washer
265	Spring
401	Side bracket (R)
402	Bevel gear
403	FL gear
404	Door arm
405	Switch arm
406	Spring
407	Drive arm
408	Cassette holder
409	Side bracket (L)
501	Cylinder motor
951	Screws (3 x 8)
952	DT screws (2.6 x 10)
953	DT screws (2.6 x 6)
954	BT screws (2.6 x 6)
956	Screws
957	Screws (M2.6)
958	DT screws (2.6 x 8)
959	DT screws (2.6 x 5)